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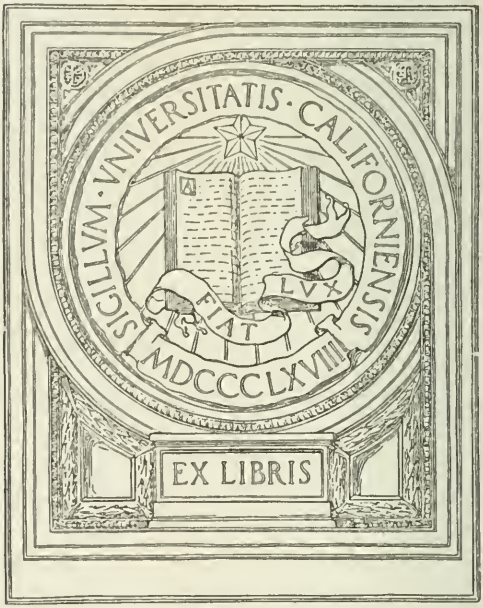

A NARRATIVE-ESSAY

ON A

Liberal Education,

CHIEFLY EMBODIED IN

THE ACCOUNT OF AN ATTEMPT TO GIVE A LIBERAL EDUCATION

TO

CHILDREN OF THE WORKING CLASSES.

BY THE

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A NARRATIVE-ESSAY

ON A

Liberal Education.

Many are speaking and writing about Education, —some with authority. The Education of every class of the community, and its bearing on the national character and the future prosperity of England, is under discussion.

First, how to promote and extend the Education of the lower classes, and make it tell on the arts and manufactures of the country.

Secondly, how to supply to the middle class a better Education than has hitherto been within their reach, and what is the character of the Education that shall be most serviceable to them.

Thirdly, what changes and developments shall be made in the system of Education given to the wealthier classes of the country.

These subjects are all now under discussion, and the essays and speeches bearing upon them are read and thought over by those who are interested in the progress and well-being of their country.

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As a contribution towards the discussion of the foregoing questions, I give, in the following pages, not a theory as to what ought to be done, but a narrative of what has been done,—a narrative —somewhat detailed—of an attempt to give a liberal Education to boys of the working class.

The School to which I allude is not unknown by name to friends among whom have been circulated, from time to time, narratives printed with a view of elucidating the moral system there pursued.

This School, taking its rise from a very small beginning twenty-one years ago, has been developing to the present time, and has been, and still is, a source of very great hope, interest, and happiness to those connected with it.

This mode of approaching a subject, which may be called the "topic of the day," will, I trust, commend itself to many minds. A valued colleague of the writer's (Harry Dupuis), when he was leaving Eton for a sphere of parochial work, said to him, "We don't want essays on Education—we have plenty of them. Tell us what you have done, and how you have done it."

Harry Dupuis is no more; but others may share the feeling he expressed, and consider the narrative, at this juncture, not ill-timed. For even if it seems that the accidental circumstances surrounding St. Mark's School are too exceptional to allow it to be a model, in every respect, for

schools of the poorest class, I hope it may suggest some hints to those engaged at this moment in the establishment of middle-class schools.

I need not say a word about moral training here. I have written so fully on this subject in all the educational tracts and stories above alluded to, that it would be superfluous to say more.

It is only necessary for me to premise that the power of sympathy—"the contact of human living soul with human living soul"—is presupposed in all that may be said about intellectual culture in the present Narrative-Essay.

The first detail I shall go into is about church. By all means, where the opportunity allows, take the boys to a service in church daily. We have always begun the day by going to church. In fact, the church is the first place of meeting each morning for the boys coming from their various homes. And here we have taken a useful hint from the custom of public schools. Instead of the school children being formed two and two, and put into their seats in church like sheep into a pen,—that is, instead of the string of boys being passed into a seat till it is full, upon which the next seat is opened and filled in like manner, —each boy at the beginning of the school-time has his place in church allotted to him.

This is the first instance I have to name of a

principle that pervades the whole of our system,—the individualizing each boy, and so creating a sense of individual responsibility.

In each boy's place hangs a little bag containing his hymn-book, prayer-book, and Testament, these remaining for his daily use in church; and, as the united cost of the three books only amounts to the sum of sixpence, the expense of a separate set of books for use in church is not more than parents of the working class are willing to afford.

Each boy, then, on coming independently from his own home, enters church and goes at once to his own place. We take the precaution in arranging the places in church to intermingle in order the elder and the younger boys. A number of very little boys together are apt to be fidgety, and the trust that is implied in placing a little boy on either side of an elder boy begets trustworthiness.

With this precaution, and a few distinct rules of conduct, such as would suggest themselves to any watchful parent, the boys are very much left to themselves; we trust to the force of public opinion, general habit, and a prevalent wish to do right, for good and reverent behaviour. It does boys much more good to see the Masters trying to get good to themselves by following the prayers and lessons, than to be kept in order by a Master's eye looking about and resting on them, his own

attention being manifestly distracted thereby. It is better even that instances of misconduct should occur and not be seen or noticed, than that the eye of the Master should be on the watch. And it is obvious, that a decent reverence of manner, produced by habit and the force of opinion and good feeling, is far more valuable than the most punctilious behaviour, the consequence of being closely watched.

The daily morning service thus conducted is an incalculable blessing to the School: it has a gradual, quiet, but most sensible effect on the whole tone and bearing of the boys. The service is shortened; it does not take more than from fifteen to seventeen minutes. We have only one lesson, that from the New Testament, and each boy having his prayer-book, hymn-book, and Testament, the burst of young fresh voices as they read the alternate verses with the officiating Minister, or sing the hymn (for the whole School learn to sing by note), is animating and helpful to one's own devotions. So is the stillness during the reading of the lesson, each boy following it on the pages of his own Testament.

It is a comfort to think that these boys by ear and eye, and without the irreverent familiarity engendered by using the Holy Scriptures as a school-book, are getting day by day additional acquaintance with the Word of God, at least with that part of it most suitable for the reading of Christian

boys. Three times a year in the course of the daily morning service do they go through the Gospels and the Acts of the Apostles.

Now, as I am persuaded that most of what it is the present fashion to call distressing doubts about the very fundamentals of Christianity arises from want of reading reverently and regularly the Gospels, I prize this method, whereby an acquaintance with the facts, the words, the spirit of the Gospels is being very quietly and gradually, but steadily, imparted year by year to our boys.

The reader of the morning lesson is one of themselves. Good readers with distinct articulation are chosen for the duty. Of course, if the boys were affected and read with self-consciousness, this would not answer. But in good English schools of a manly character, and where hard work is done, boys are not affected or self-conscious. It is delightful to observe how free they are from this fault; I am certain all good Schoolmasters will heartily agree in this statement.

That being the case, there is a very great charm in the reading of the Gospel lesson simply and reverently by a young boy with a clear fresh voice. The whole congregation seems to feel it.

To the objection sometimes urged that a service in church takes so much out of the daily school-hours, it may be replied, that it is an admirable and powerful incentive to good reading for the boys of a school to hear a chapter, which they are

following with their eyes, well read by one of themselves. Especially it is useful to boys in the lower divisions who do not often come in contact with those of the upper division, out of which the readers in church are naturally selected: they see the result of the rules and the method of teaching that are applied to themselves, and this makes them attend to those rules and do their best.

I repeat emphatically what I said many years ago,* that the reading of the Psalms, by the boys of a school, verse about with the officiating Clergyman, and their following with their eyes on their books the lesson which is being read by a good reader from among themselves, will do more to teach good reading than the same amount of time spent in common reading lessons, or at least it admirably supplements those lessons. But this is altogether a minor consideration.

It is desirable that the boys should have plenty of room allowed them. A little expense which may make them feel that they are thought of, and that their comfort is attended to, will not be thrown away. Each of our boys has a separate kneeling cushion provided for him. The silent effect of arrangements that make boys feel that in the house of God boys and Masters are all one —that, one beside the other, they are praying to and praising Him who is equally and infinitely above both—is to engender a tone and feeling in

* See "Account of St. Mark's School, 1857," pages 42, 43.

reference to Divine worship just and true, and of the highest value to the boys.

When I think of the number of newly-built or restored churches which there are throughout the country, many of them close to the school and parsonage, I cannot but regret that they are not thus utilized on week-days, and that the Clergyman of the parish has not the opportunity of meeting each morning the boys and girls of his Parochial School in his church.

In our church the seats on one side of the centre aisle are appropriated during the week-days to the boys; the opposite side is sufficient for the girls and the other attendants at the daily service.

I now leave this, the most important part of my whole subject, with one concluding remark: I have heard the heads of establishments say of different social arrangements, that such or such (*e. g.*, the appointments of their dinner-table or the like) were the key-stone of the discipline and good order of their house. I say that the daily quarter of an hour in church is the key-stone of the moral tone of our School.

On leaving church for school the boys fall into rank in different divisions under their respective Masters. For it is a feature of our system, derived immediately from the Public School system, that each Master has a separate division of the School, for which he is responsible. It cannot

be expected that a Master will work with energy and hope, if he has not full credit for the success of his work. The system, therefore, of having a set of Assistants or Monitors, with a Head Master exercising a general superintendence over the whole School, I have long given up as unsatisfactory.

Each Master is wholly responsible for the tuition and discipline of his division. Parents look to him and communicate with him, and the credit for the good discipline and progress of his division is wholly his own.

I most strongly recommend that at any school where there is more than one Master this system should be adopted. I am happy to say that the Committee of the Windsor National School, instead of having one Head Master to superintend a staff of Junior Assistants and paid Monitors, have appointed two Assistant Masters in addition to the Head Master, each to be responsible for a division of the School; each Master probably to have two "standards" out of the six under his tuition and superintendence; and the school-room is being divided that each Master may have a separate compartment for his division.

It may be mentioned here that the last week of each school-time is devoted to an examination in the work of the preceding half. As soon as the examination is finished the boys separate for the holidays; and when the result of the exami-

nation is made out, the new school-list is printed, in which the meritorious of each division are placed in three classes according to merit, followed by the unclassed, if any—those who have taken a high class entitling themselves thereby to be placed in a higher division the following school-time.

This system is very efficacious in giving tone to a school. The assurance that industry and progress will be rewarded by accelerated promotion gives a healthy stimulus to exertion; indeed, what stimulus can be more healthy than the wish on the part of a boy for an advancement, (which does not necessitate the keeping back another,) into a higher division of the School, where he will do harder lessons and associate with more advanced boys.

This, of course, is none other than the system pursued (with perhaps certain varieties of detail) in most public, and good Grammar Schools. My reason for naming it here is that it has been found capable of application in a day-school for children of the working class, and has been of incalculable benefit to the school.

An observation of our former Inspector, Mr. Bellairs, is very much in point. It is, indeed, so very flattering, that I should hesitate to repeat it here, if it did not give a most valuable testimony in favour of the system of divisions which I advocate.

He had begun his inspection at the bottom of

the School, and worked up, taking division after division, to the top ; when it was over, he said that the School reminded him of nothing so much as of a paper mill, where one sees the rough rags put in at one end ; and each step of the process refines and purifies the material, till the clean white paper comes out at the other end.

The sense of trust and responsibility will make a good Master out of an imperfect one. To call upon him to take now this class and now that, at the bidding of another, without his having either responsibility or credit, will go far to spoil a good one.

While we have been talking over these matters, we will suppose the boys have been walking from church to school.

When they get to school, what do they find there ? In the first place, plenty of oxygen. The Government requires eighty cubic feet of pure air for each child. We give them four hundred. So that we never, even at the end of a long day, see any symptom of the presence of carbonic acid in the pale face, drawn features, and languid eye.

As they enter, each boy hangs his cap and over-coat on his own peg ; those who come from a distance, and do not return to their homes till the evening, drop their dinner-bags into the large basket which the matron holds to receive them, giving her a kindly greeting as they pass on to their covered playground—(a grand refuge in wet

weather). Here a short inspection takes place to see they are all tidy; after which they ascend by the different staircases to their several compartments of the great School.

Here again we seek to educate them to a sense of individual responsibility by giving each boy a locker (which, by the way, does not lock); in this he keeps and takes care of all his books, paper, pens, and school requisites: this plan we adopt even with the little boys, that they may early learn to take care of their own property and to respect that of their neighbours. Dr. Keate used to say that a boy's bureau was his castle; so we say of the locker. It is poor training to take charge of a boy's slate, book, pen, &c., to give them out for the lesson, and then take them back. It may *look* very orderly, but it is not good education. Let the boys be treated as moral agents, not as so many parts of a great educational mill which is to be kept in good working order.

Another provision that works well is to have a large tablet suspended in the compartment occupied by each division, on which there is a weekly register kept of the industry, conduct, and progress of each boy; a box of large printed letters and figures, with a pot of paste and a brush, and the help of one or two of his division, enables each Master weekly to add on to the previous record the result of the current week; this register the boys always have before their eyes. Any person inter-

ested in them, such as the Clergyman of the parish, or the promoters of the School, can, at a glance, tell how the boys are getting on. Every week that they continue free from a blemish for inattention, irregularity, and the like, makes them all the more anxious to keep free from blemish the next week. And, as they see their marks for school and home lessons *grow* weekly, they are all the more anxious they should keep on growing.

It is pleasant, when a half holiday at Eton allows me to do so, to go to the School and see who deserves a shake of the hand or a pat on the back for his sustained good conduct and industry through the school-time. Weekly reports are also sent home, and much valued; and the periodical meeting of parents, when the final result of the weekly register and of the examination at the end of the school-time is given out, is a most festive and happy day with us.

At the end of the covered playground we have a row of warm baths, and all boys must either be washed all over at home at least weekly, or have a bath at school. Practically, the baths at school are a real delight and enjoyment to all, and a great source of health. I am afraid to say how much the rate of mortality was decreased at the Hanwell District School by the introduction of soap and warm water.

But of all the arrangements at St. Mark's,

none is more valuable, morally or socially, than the provisions for the boys' retiring closets. So valuable are they, that I hope no reader of these pages who is building a school, or altering school premises, will omit to come and see, or make inquiries about what Mr. Street has done for us in this respect.

We now come to the *vexata questio*, the chief subject of discussion in all the daily speeches and essays one meets with on Education. By what studies shall we inform boys' minds, and cultivate their intellects? Of course, all agree that the foundation of Reading, Writing, and Arithmetic must be first laid. Of these, I have not much to say. But, as I wish to be useful, I will say a few words on each of these heads.

I. Reading.—The rule for attaining the art of clear, articulate Reading is a very short one—

FINISH YOUR WORDS.

Do not let the last consonant be divided from its own word and tacked on to the next following,—for instance, do not let the words "dwelt in" be read as though they were written "dwel tin." Expression, force, and propriety in Reading must be gained by a general quickening of the faculties. —(*See* Appendix A.)

II. For Writing, a short, good rule, which we

owe to Mr Harris, the old Writing Master at Eton, is, point the knuckle of your fore-finger to the ceiling. A pleasant occasional exercise is to balance a halfpenny on the knuckle of the fore-finger; if it does not slip off till the end of the copy, let it then slip into the writer's pocket.—(*See* Appendix B.)

III. Arithmetic.—Prolonged experience teaches me that explanation of principles in teaching Arithmetic may be easily overdone. I have erred myself in overdoing explanation again and again. Give out the rule; let them write it out, learn it, and do a number of examples by it. An occasional pithy and pointed explanation of a principle is all very good, especially when accompanied by some practical illustration.

For instance,—a square of ginger-bread or a plate of apples is admirably useful to illustrate the definitions and fundamental rules of vulgar fractions, especially if the "parts into which the unit is divided" are at the close of the lesson shared amongst the members of the class; but lengthened explanations children cannot follow.—(*See* Appendix C.)

Any account of the Education given at St. Mark's School would be very incomplete without a reference to Music. I will here, then, introduce parenthetically what I have to say. Singing by note is taught as part of the school business to

every boy. All that I said in the "Account of St. Mark's School," published in 1856, I endorse now.

As to the intellectual, moral, and social benefit of the study, I am fortunate in being able to leave to others less prejudiced than myself to say if they think that the experiment has been a success.

The College of Eton, in instituting a choir of their own for their chapel services, have done me the honour to take their choristers from St. Mark's, and have endowed the School with twelve choral scholarships. Simultaneously with this step, they have appointed as their organist, and as the head of the music at Eton, the Rev. G. L. Hayne, Mus. D., Oxon., himself an old Etonian.

Now, Dr. Hayne is in daily intercourse with these choristers, and he can therefore, better than any one else, measure them musically, mentally, and morally. To him with confidence I leave it to say if he thinks that the result of our having made music at St. Mark's a study, not a pastime, is good.

To resume :—The foundation of reading, writing, and arithmetic being well laid, what next? Is it to be History? Geography? the knowledge of common things? an insight into the interesting discoveries of our age? My experience tells me, *No*. These are not mental *cultivators*. These are not what dig, plough, harrow the brain. These are rather of the nature of seeds which, when

thrown into ground previously prepared, take root, grow, and bear fruit. Then what is the mental cultivator that is to prepare the ground? *Language*, I should say undoubtedly. Is it to be English or Latin? I answer, both.

Our Schoolmasters having been trained at St. Mark's and Culham Training Colleges, there is naturally far more attention paid to the study of English with us than at regular classical schools. English words are analysed, their formation and meaning traced, synonymous words are examined and distinguished, metaphorical sentences are put into common language: the analysis of sentences also is a favourite exercise, and the boys seem to get a very intelligent knowledge of the structure of language thereby.

Reading lessons, as in schools for their class and age, form a prominent item in the work of each day, and through their reading lessons they get an extensive acquaintance with good English authors; for not only are School Reading Books now very good, and improving every year, but Allman, (by his circulating library for schools,) and other enterprising publishers, enable us to put standard authors into our boys' hands, such as "The Tales of a Grandfather," "Robinson Crusoe," "The Fool of Quality," (that grand old book full of generosity and chivalry, without a shadow of modern flippancy,) Shakespear, of course, and Sir Walter

Scott's Poems and Novels,* the sentiment and romance of which form a good antidote to the slang and flippancy in which much of the modern writing which comes within the reach of schoolboys is steeped.

Speaking of these matters, I cannot omit to record the great benefit which Mr. Warburton conferred upon the School when he was our Inspector. He not only told us that we should find the learning—with perfect accuracy—good and choice pieces of English to be spoken with great care, good articulation, and proper emphasis, a valuable educational exercise—but he further found time, amidst his avocations as Queen's Inspector, to gather for us and copy with his own hand a long manuscript of most choice pieces of English,—"The Battle of the Nile," "The Mining Adventure in Peru," "Physical Geography," "St. Peter's Chapel in the Tower," "Material Progress," "The Earl of Warwick," &c., culled from such writers as Macaulay, Dr. Arnold, S. T.

* It may not be amiss to remind my readers that Sir Walter Scott's Novels may be had for sixpence each complete work; of course, they are in paper covers; but if *before* the book is given out as a reading book a few holes are stabbed in it with a bookbinder's awl, as near the back as possible, (for there is very little margin,) and a bit of strong carpet-thread or wax-end be drawn in and out through the holes tightly, the book will never fall to pieces, and will last, as a reading book, as long as if it were bound.

Coleridge, Southey, and his own poor brother, will fix him for a long time in our memories.

We found his words most true. His pieces of English, in style most beautiful, and breathing manly and heroic sentiments, have been a precious possession to the School. I can testify that this most kind act of his has done the School the greatest good both intellectual and moral; and I would venture to suggest that if he would add other pieces to those which he has selected for us, and were to publish them in a book, he would be conferring a benefit on other schools which is now confined to ourselves.

I trust all this will satisfy Professor Seeley that English is not overlooked, but neither am I disposed to forego Latin. At least, we have begun it with our lads at St. Mark's School, three years earlier than the age which he names (fourteen) for beginning Latin; and, I cannot help seeing, with the best result.

Shall I be called a "Philistine" if I urge that Latin is a fine thing for "evening lessons?" There is something very definite in committing to memory a page of accidence, and in a Latin exercise or translation, which has to be done, written out fair, examined, have its faults marked and corrected. I have never been able to make English such a good old-fashioned lesson as this—boys cannot always be learning choice bits of poetry, and to be told to look over so many pages

of synonymes, or of history, geography, &c., is not definite like a Latin exercise.

But, besides this, I am persuaded that the inflections of Latin give quite a new view of the reality of concords. And, as an instrument for cultivating the mental faculties, what can be better than an exercise that requires a simultaneous effort to get number, gender, case, tense, mood, person, all right together. To an educated person all this seems to come intuitively, but it should not be forgotten that to get each of them right requires a separate mental effort when a boy is constructing a Latin sentence.

The boys like their Latin lesson; they are interested and animated by it; a little knowledge of Latin they find a great help in pulling English words to pieces; and they analyse the structure of sentences in the English fashion all the better from parsing their Latin lesson.

With regard to grammar. Whether they first read the progressive sentences in their elementary Latin-books and build up for themselves (under the teacher's guidance) laws, rules of construction, or take the law at the hands of those who have travelled over the ground before them, and trace its action in the structure of the sentences framed for them, and subsequently in those authors whose writings they may read, is a question which I do not think worth fighting about.

What is wanted is that their knowledge of

language should be systematic, drawn up in orderly array, under well-defined rules which they can apply. And it is not less valuable surely, as an intellectual exercise, than the arrangement of stones, or flowers, or insects, in classified order.

It is but a little way that we go in Latin, but every step seems to be valuable, *per se*. Of course, we do not touch verses, that is beyond us. But finding, as we do in familiar intercourse with these boys, that ready discernment, quickness of apprehension and thought, the power of taking in and estimating what is said, of reading a glance of the eye, seeing the point of a joke, or detecting covert irony:—in a word, a general mental acumen is developed by their study of language, I feel disposed to say, if Latin, so far as we go at St. Mark's, gives this mental activity, why should not the good effect of the exercise go on if the boys were able to advance yet further? What if in addition to getting mood, tense, person, number, gender, case of a sentence, all right, they were still further required to bring out the sentence subject to metrical rules and the rhythm and point of verse?

Are we quite sure that the Remove and Fourth-form boy is not deriving intellectual profit from that "worry and torture of brain" which makes him knit his brow, bite his pen, and turn from Gradus to Dictionary and back again from Dictionary to Gradus? Especially as it is an

exercise that is enlivened, I contend, from time to time, with pleasurable emotion. Who cannot call to mind his looking back on a couplet which he hoped was rather good, and the thought arising, "I wonder what my tutor will say to that verse?"

How long this work should continue, at what time, if a boy does not become a good composer, verse-making should be given up, I do not pretend to say. But this I do say, before we give up verses as mental cultivation and training, let us see that we have something to put in their place that will do intellectually the same or more good.

Mr. Farrar, I suppose, will answer with an unhesitating voice, "Science will do it." And very beautiful is the posy of scientific flowerets which he gathered from the fields of modern discovery, and presented to his charmed audience at the British Institution. With such art and grace were they entwined, that I could not but ask myself, How much of his power in running down verses does Mr. Farrar owe to his having worked at verses?

Is he not somewhat in the position of a Swiss mountaineer who, having by hard labour reached some Alpine eminence, now luxuriates in the charms of his high position, and despises, flings away the good staff which helped him to surmount the rugged difficulties of the ascent, and enabled him to crown the height?

In like manner those brilliant speeches of Mr. Lowe, with which he is shaking the country's traditional opinions about Education, are not their wit, vivacity, and power due to that intellectual training which he would bring into disrepute ?

His enthusiastic audiences, who are exulting in his slashing cuts and telling hits, do not reflect that his sword was sharpened and his arrow pointed by that very engine the cumbrous inutility of which they are laughing at.

My reason for not using science, I ought rather to say scientific information, as an instrument of intellectual Education, I have stated above. In ordinary hands it is not a good instrument for *cultivating* the mental faculties.

I have on all occasions* expressed my contempt and abhorrence of that species of mental training which was in vogue in our advanced, sharp National Schools some fifteen to twenty-five years ago,—a training which consisted in putting into minds not prepared to receive them—and wholly incapable of digesting and assimilating them—the facts of geography and history, and crude morsels of scientific and miscellaneous knowledge.

I got a lesson when I was a very young schoolboy, which I have never forgotten. We had taken a wood-pidgeon's nest, and brought home in pride a fine, vigorous, young bird nearly fledged.

* See "Account of St. Mark's School, 1857," pages 27, 28, and "Reminiscences of a French Eton," page 74.

It was our ambition to rear it. We went out and bought some beans, dry horse beans, opened its beak, and slipped one and another and another of the beans down its gullet. Thinking that we had given it a good meal, we left it for the night to digest its food. The next morning we hurried to see our bird; the result may be anticipated. It was lying at the bottom of its cage with an extended crop, dead. We had given it food which it was not able to digest, and so had killed it.

When I have listened to a National Schoolmaster giving to school-children crude morsels of scientific and miscellaneous knowledge, which they gulped down, indeed, but were clearly unable to digest, "It is *beans*," I have said to myself, "that he is cramming down their throats: instead of nourishing them, he is intellectually killing them."

If, during these last twenty and more years, St. Mark's has sent out into the world young men able and intelligent, fitted to be good and useful men, it is because this practice I reprobate is there eschewed; the aim of the School being not so much to impart knowledge as to develope the boys' faculties, and to teach them how to learn.

Now, in answer to the cry for science, which resounds in the present day, I fear a recurrence in schools of a higher rank to the bad system which has been of late years wisely abandoned in schools for the lower class.

Another danger to be apprehended is this, that boys, finding that they are to be released from severer study on the ground of its being distasteful, more and more will find severe study distasteful, and that thus our English boys will lose some of that mental vigour which they now have, and take with them into the affairs of life the weakness which belongs to discursive and superficial men.

To follow out one subject in which the learner feels interest is a splendid Education. "One subject thoroughly," says Professor Tulloch, most wisely.

What man is there of any class more worthy of respect than the mechanic, who, after his hours of toil, takes up a study or pursuit by which he may educate himself—be it a branch of mathematics or philology,—engineering, drawing, flowers, stones, or beetles. And the inquiring mind and persevering spirit which the artisan shows in thus educating himself is met with in other classes and in different conditions of life.

I recollect being once for some days wind-bound in one of the least interesting spots I remember to have visited,—the island of Alderney.

Among the few families that were to be found on the island, I had the pleasure of meeting a lady who had turned the dull island into a paradise of beauty and interest. Folio after folio she showed me containing treasures of beauty in form

and colour, such as I had no idea existed on earth. In fact, she lived in a world of beauty and order; her knowledge was extensive and accurate, her conversation was as instructive as it was charming and animated. I found she was in correspondence with men of European celebrity. How was all this brought about? Why, she had gone to the bottom of *sea-weed!*

Another vision of past days now comes up before my mind. I was in a bookseller's shop in Paternoster Row. An old pupil accosted me. We kept together a good part of the day, talking of old days and many things. I found he was in quest of books, learned, rare, old, to assist him in disentangling some intricate point of historical geography. He accompanied me to the station, and then left me to return to his quarters. He was in the Grenadier Guards and was stationed at the Tower.

My old pupil has since risen to an exalted position in the country, deservedly honoured, admired, I might add, beloved by a large circle of friends. When I hear him extolled by those who know him, I think of the day when I watched the young officer of the Guards returning to the Tower to meet the learned books he had ordered, which were to help him in his careful search after truth.

Here are instances of the highest and most valuable kind of Education; but the Alderney lady, the young Guardsman, the Manchester artisan,

are not common types of their several classes. They are exceptional cases. They re-appear, at intervals, as Eton or other public schools-boys, but these are just the boys who give us no trouble or anxiety; they would make themselves under any system. We get great credit, indeed, and praise for their success, but it is credit which we only partially deserve: on the other hand, we deserve a great deal of credit in cases where we get little or none. I mean in the case of boys of no intellectual or moral power, whom, by care, and patience, and fellow-feeling, we have led to use self-control; whose weak or dormant faculties we have called out, and whom we send out into the world not indeed to shine, but to stand on a higher intellectual and moral level than they would have reached had they not passed through our hands.

Now, it is these last that form the bulk of humanity; it is for them, and not for exceptional cases, that we must legislate and form our plans. And it is for the mass that I fear, when I hear the cry that boys should be freed from the severer labour of studying language if it is distasteful, and therefore, it is said, unprofitable, and should learn, instead, something about the wonders which science has achieved within the present century.

Suppose them freed from verse-making, and from learning about γε and ἄν and allowed, instead, to learn about the electric telegraph, the lightning conductor, the electric light, the Davy

Safety Lamp, chloroform, and vaccination, (for these—deprived of the poetic imagery with which he surrounds them—are the subjects which Mr. Farrar puts in the place of the idol worshipped in the shape of classics,) would there not be a great danger of the boys becoming less vigorous-minded than they are ?

Certain of them I grant might, and doubtless would, educate themselves by botany, chemistry, electricity, and the like. But it will be those who have an inquiring mind, and a decided love for the science which they take in hand. But how will it be with the mass ? Will their becoming acquainted with a string of scientific results stand them instead of the mental training they now get ?

Am I satisfied with the training we now give to boys through our own subjects ? By no means. But do not let us therefore begin on another tack ; let us try to do, what we do, better.

And notwithstanding the imperfection of our teaching and the idleness of the boys, what are the intellectual characteristics of the pupils which the public schools of England turn out ? Is not their apprehension quick, and discernment ready and correct ? Do they not take in, weigh, and set at its true value what is said, with a perfectly marvellous quickness and unerring instinct ? If an observation is just, in good taste, well-timed, do they not feel that it is so, and respond ? If not, do they not detect the weakness or fallacy

instantly, and eschew it? Will they tolerate verbiage? Have they not a fine sense of the ridiculous?

When Mr. Hullah was giving singing lessons at Eton, he made two observations on the characteristics of his Eton class which showed his penetration. First, that they seemed all one, bound together as by a three-fold cord; compared to them, his other classes appeared encircled by a rope of sand.

His second observation was, that, in teaching them, he was baffled by the quickness of their apprehension. Before he had finished his sentence, he felt that they had hold of it, and had time to become distracted and inattentive, while he was adding such further explanation as he commonly gave to his classes.

And as we trace them on in life, I cannot but think that we see these intellectual characteristics of public school-boys developing themselves. Who shall say how much the quick appreciation of practical good sense which characterizes the House of Commons, its intolerance of humbug, its admirable instincts, and the other kindred qualities in which the country feels both pride and confidence, are due to the large number of public school-men which it contains?

Look, on the other hand, at those who have not been under the training of our public schools, nor have formed themselves, by some study or pur-

suit, of a solid, vigorous character, but, instead, have dabbled in science,—men who have left the beaten track of classics and mathematics for the flowery meads of scientific discovery. They are not a numerous class, and are still rather un-English. But here and there they may be found. I dare say most people have one or two specimens of the class before their mind's eye. If so, they can say whether I overdraw their characteristics in describing them as self-complacent and self-conscious; wanting in manliness, in vigour of mind, and in sound judgment; mouthy-talkers, without the sense to know that they are dull; even in their own subjects apt to be hazy, and when talking of one scientific subject, to confound and jumble it with another: a public school-man may very possibly be profoundly ignorant of both; but he honestly says so, while the sciolist indulges in grandiloquent twaddle about what he does not understand.

I leave it to English parents to say into which of these two types of men they would like to see their sons grow up.

But are public school-men to be profoundly ignorant about the various interesting and marvellous discoveries which modern science is daily making, and their application to the comforts and conveniences of life? Is the choice of necessity to be between ignorance and sciolism? By no means.

In advocating the study of language as the best means of educing the mental powers,—of doing the work of digging and harrowing the brain, I have said only half my say. A mind educated by classics alone is only half educated. There is a book the study and understanding of which will make the education complete. No one who is master of that book can ever be a sciolist, and he will be mentally prepared by it to survey and firmly to grasp all branches of natural science: he will find it a master-key that unlocks all such knowledge. His mind, imbued with that book, will deal with scientific subjects in a manner in which, without the knowledge of that book, it never would have done:—and that book is *Euclid*.

But are we met *in limine* with a difficulty? Is this first step, the mastery of Euclid, so difficult a step, that it cannot be taken by the average of our school-boys? Is it necessary that they shall give up the attempt? must they be satisfied with a humbler and more incomplete and unsatisfactory acquaintance with natural science?

Mr. Wilson inserts, in his very interesting essay on a Liberal Education, a note, over which I have thought much since reading it. He writes as follows:—"The extreme repulsiveness of Euclid to almost every boy is a complete proof, if, indeed, other proofs were wanting, that the ordinary methods of studying geometry at pre-

paratory and public schools are wholly erroneous." Mr. Wilson speaks with deserved weight and authority. But I must say that the extreme repulsiveness of Euclid to almost every boy is not a fact which has come under my own observation.

And holding as I do most firmly that a man is not perfectly educated unless to classical study he adds the mastering of Euclid;—and that any one who has mastered Euclid has hereby the best of all preparations for a profitable study of all branches of natural science, I feel almost bound to speak,—to say what my experience is,—and to add some hints that I hope may be useful.

It was in the year 1836 that I began to teach Euclid at Eton, and I have been teaching it ever since. Among the brightest and most interesting hours of my life have been those that I have spent in initiating boys, even boys of very weak mental power, into the knowledge of Euclid. I make this statement because I think it stands to reason that this would not have been the case if the study had proved repulsive to our pupils.

The first steps to many minds, I grant, are difficult,—to some, very difficult. But the teacher is cheered on by the thought that the more difficult the appreciation of geometrical reasoning is to a boy's mind, the more does that mind stand in need of Euclid; the more good is he doing to the boy in trying to make him understand it.

In looking back through years of experience, I feel borne out in saying that at Eton we do not find Euclid, as a rule, a repulsive study.

Boys of very low mental calibre have taken to it, have been interested in it, attracted by it, and have said to me again and again, "It's the best thing we do at Eton."

The Euclid hour is always a bright one. Whether we are taking the first steps with feeble pupils; or breaking fresh ground with a more advanced class; or, recapitulating, we are linking on proposition to proposition; or, reversing the operation, we are tracing a proposition backward, through those on which it depends, to first principles; or lastly, are setting the class to work their brains on riders and exercises,—every phase of Euclid teaching is pleasant in the retrospect.

Of course, I have had my disappointments—what Master has not?—in boys not using the personal effort necessary to reproduce what they have learned. Many *have* done so, and many a time I have had to thank them for giving me a satisfaction, one of the greatest a teacher can have, that of finding that pupils retain and have made their own what he has taught them.

But, whether the boys of a class be studiously disposed or otherwise, I cannot call to mind any to whom Euclid could rightly be said to be a repulsive study. If ever I say to a class, "What shall

we have to-day?" I am sure the cry will be, "Euclid."*

And turning from my experience of Etonians to boys of a totally different class and station.

I have now fresh in my recollection the heart-felt pleasure of a weekly evening meeting through last school-time with a party of St. Mark's school-boys, whom Mr. Blythe (the Head Master of the School) sent to me for a weekly lesson in Euclid. They were boys of ages ranging from 12 to 15. I took them through the third book of Euclid: we only used enunciation books. I set before them what had to be proved, and left them to find out the demonstration, helping them if necessary by giving the figure, and referring them to the propositions on which the proof depended. I do not know that there was a demonstration that they did not make out for themselves. Each would look keenly at the black board where the figure was drawn, and give me a nod when he had made out the demonstration. Then came the comparing notes, and great was the fun and hearty the laughter if one made a slip, or assumed what he had no right to do. The school-time was crowned by as beautiful a Euclid-paper from

* May I take the observation that has been made to me more than once by a Cambridge tutor, "that in looking over Examination papers, it is refreshing to come on an Eton man's Euclid," as a corroboration of my assertion that Euclid is not found repulsive by our Eton pupils?

almost every one of them as I ever looked over.

It was only last night that one of them, who is leaving school, came with his father, to give me (according to our custom) his photograph and take leave. His manly workman father stood beside him, and the tears found a channel for themselves down his furrowed cheeks, tears of thankfulness at the thought of what St. Mark's had done for his son.

Nor were the boys who formed this evening class more than good boys of average ability. The very boy who took leave yesterday (he will not be angry with me for saying so), when he began Euclid, used to jumble the *data* and *quæsita* in admired confusion in his brain. I thought at one time (good boy as he always was) he would never master Euclid, but I found him last school-time as sharp and clear-headed as any of the party. He would "spot" the false step in the reasoning as quickly as any one of them.

And not only is the Euclid lesson an interest full of charm, whether with my Etonian pupils, or with mechanics' children at St. Mark's. It forms a bond of firm friendship in after life. How often, amidst the mountains and valleys of Switzerland, do I find my hand grasped, and, looking up, I see an animated face, radiant with pleasant memories! "What, don't you know me? I am one of your old μύσται,"—alluding to a long and

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growing list that used to hang up in the mathematical school of "the Initiated," that is, of those who understood and could apply the fourth proposition of the first book. These were my μύσται. The Platonic motto "μηδεὶς ἀγεωμέτρητος εἰσίτω" standing at the head of the list, shut out the *profanum vulgus;* and hearty, nay, vehement sometimes, were the struggles to get into it.

All this I feel to be very outspoken; but the matter in discussion is too interesting and important for me to be squeamish about speaking out.

And if we do interest boys in Euclid, and make them like it, only think what we are doing for them. Lund, in his Preface to his Geometry, says :—"Next to the Bible, Euclid is the most wonderful book in the world." I prefer to place the Bible in a category by itself, and, drawing no comparison between it and any other book, simply to say, Euclid is the most wonderful book ever written by man. Undoubtedly it is so. It is the book which has moulded European thought from generation to generation.

Even in those nations who have given up Euclid as a text book, the mind has been trained to habits of thought by the rigour and precision of geometrical reasoning of which Euclid is the father. But we Englishmen, with our stability of taste, and our love of linking ourselves on with the traditions of the past, still use the very text

of Euclid for mental discipline and training. We value its calmness, its dignity, its permanence. We find Euclid to be a book the tendency of which is eminently to give what St. James calls "the meekness of wisdom:" there is no self-consciousness, or conceit, or affectation in the quickened intelligence which its study imparts.

For myself, I can safely say that I can remember few hours of greater enjoyment than those in which—shutting out the noise, eagerness, and contention of the outward world, and taking up a book which has held its ground for more than two thousand years—I have endeavoured, by its help, to open the minds of the young, to bring out those faculties which God has given them, by the calm and unimpassioned investigation of truth, for truth's sake, to which its pages guide us.

It was a happy day for me, and a proud day, when a party of my old μύσται who had entered into the Indian Civil Service, presented to me a copy of a Euclid which they had translated into Hindustanee, as the surest and best way of bringing the Asiatic mind and mode of thought into conformity with the European.

Again, as I have said, Euclid is the true entrance to the natural sciences,—and a noble entrance it is,—how much better to enter on them thus, than to scramble up in some other way!

What, for instance, is the greatest and most

elevating of all the natural sciences? It is that, incontestably, which issues in the researches and discoveries of Physical Astronomy.

When we have made a pupil appreciate Euclid, we have placed his foot firmly on the first step of that great intellectual ladder which leads by natural and continuous sequence, step by step, up to the highest researches of celestial mechanics. The highest steps of this ladder no man has ever reached; but the most highly gifted among mankind are those that have climbed highest upon it, and are climbing still.

Terrestrial and celestial mechanics are one harmonious whole, one continuous, unbroken rise. All matter obeys in its *mouvement* the same laws. "La courbe," says La Place,—in the Preface to his Third book of the Système du Monde,—"décrite par l'atome léger que les vents semblent emporter au hasard est réglée d'une manière aussi certaine que les orbes planétaires."

Surely, for this branch of natural science may be claimed precedence before all others. Euclid, as we have said, is the first step on this intellectual ladder, and, moreover, each successive step upon it is so much clear gain.

There is no room here for Professor Seeley's amusing simile:—"If a man is not quite up to going to Cambridge, it is no use for him to go to Royston and stop there!"

Though we may never reach the heights of

celestial mechanics, Euclid is a clear gain. The first principles of mechanics, the composition and resolution of forces, are clear gains. So is each successive step in advance, up to Newton's giant step,—"The moon is retained in her orbit by the force of gravity," (happy the man who gets thus far,) and so on. The knowledge acquired and the mental training, no matter where we stop, are both of the highest benefit.

I ask, then, with an outline of physical science so great, so pre-eminent before us,—Dr. Whewell truly calls it classical,—why should we divert our students' minds from it; and propose in its place something so shaky as experimental lectures on branches of science not yet fixed?

It is not very long ago that a chemical lecturer told me that he had been obliged to modify his printed programme in consequence of some modification of hypothesis which it had been found necessary to introduce during the preceding week! Are branches of science which give, as yet, such uncertain sounds, to be named as educational studies, with those which are based on rigorously established laws, and have acquired all the firmness, authority, and permanence of classical science?

If boys have laid the sound foundation of classics and mathematics, by all means let them

have scientific lectures and teaching.* Their intellectual training will prepare them to turn such lectures to a profitable use. What I deprecate is putting the scientific lectures in the place of classics and mathematics.—(*See* APPENDIX C.)

To revert again to Euclid. All that I have been

* The following is a list of the Lectures given at Eton, on scientific subjects, and on the discoveries of modern science, which I furnished to the Public School Commissioners at their request :—"I find that, during the last fourteen years, there have been courses of Lectures on the following subjects :—Natural Philosophy; Popular Astronomy; Mechanical Philosophy; the Forces of Attraction; Light; Heat; Frictional and Voltaic Electricity; Chemistry (at various times and in its various branches and applications), Organic and Inorganic; Chemistry of Gases, and of Metals; Chemistry of Common Things; Water in its Three Conditions of Ice, Water, and Steam; the Chemical and Physical Properties of the Atmosphere; Application of Scientific Discoveries to the Useful Arts and Manufactures; on Coal and Coal Mines; the Manufacture of Iron, &c. Also remarkable discoveries or processes, which have from time to time attracted attention, have been illustrated and explained by Lectures, such as the Electric Telegraph; Photography; Electro-Plating; the Construction of the Westminster Clock; the Bessemer Process for Making Steel; Rifling Cannons, and the Science of the Armstrong and Whitworth Guns; the Method of producing Brilliant Colours from Coal Tar; Professor Bunsen and Kirchhoff's Analysis of the Spectrum, &c.

"The following courses have also been given :—

"Comparative Anatomy and Geology; Physical Geography, including the Theory of the Winds, Rain, and Climate; Modern History; Ancient and Modern Assyria; China and Japan from Personal Observation."—*Report of Commission on Public Schools.*

led on to say in these last paragraphs is based on the assumption that Euclid may be made an interesting, instead of a repulsive, study. I have said that at Eton the boys like Euclid, and take an interest in it. I ought to do more than this: I ought to try to show how this is brought about.

Among the most charming pages of the essays on a Liberal Education (second indeed in interest only to the blunt and manly semi-autobiography given by Mr. Johnson, which they who remember his first coming to Eton know to be affectingly true) are those in which Mr. Wilson gives his graphic picture of the mode in which his colleague initiated a class of boys into the study of botany. One cannot help regretting that the poor boy who made a mistake in spelling was not privately corrected; otherwise it is a beautiful picture, valuable and suggestive in the highest degree. I can well imagine that the French Commissioner would have been charmed with the intelligence and vivacity of a class which had been so taught.

Now, I must confess to my readers that, to the juxta position of the above graphic account of the botanical lesson, and the note about the repulsiveness of Euclid, they owe the pleasure and profit, such as they are, of this Narrative-Essay, which they are reading; for the thought occurred to me that Euclid as well as botany may be made a bright and pleasant lesson; at least, I thought it

might be useful to show how we try to make it so at Eton.*

So now, as Mr. Wilson set his botanical master face to face with his forty pupils, we will suppose the mathematical master and his class are assembled for the first time for a lesson of Euclid. We will suppose them the weakest twenty of a division which has lately been advanced to that part of the school where the study of Euclid is begun.

Some few may have had some lessons in Euclid at the last school: only perhaps to hate it. These are ready to ask the question, "What is the use of Euclid?" The master deprecates the question, "Don't ask me now. We should not be talking on fair terms. I should know what I was talking about; you would be talking about—you don't know what. Wait one month. If at the end of

My readers must judge how far I have succeeded in my sketch. It has grown very long—is necessarily, in some degree, technical, and cannot be so interesting as the sketch of the lesson on botany, to the general reader. Still I hope the perusal of it will not be confined to those engaged in teaching Euclid, but that the general reader will try if he can extract some profit or, at any rate, some amusement from it. I ought also to premise that I do not make my colleagues responsible for a mode of expounding Euclid, which some grave teachers might think was trifling with the subject. They have their own methods, and I can add emphatically that some of them succeed equally with myself in making boys take an interest in Euclid. The St. Mark's Masters do teach it after my method. They learned Euclid from me, and as they were taught it, so they teach it.

that time you are a μύστης, that is, if you understand the meaning of Euclid—and then repeat your question, I will answer it; but I never met an instance of anyone asking the question after he understood Euclid."

Now, open your books. Euclid begins with definitions; of course, every subject has its own language, its technical words, as they are called. We must be agreed about the words we are going to use, and their meaning.

Look at the first definition, it is a curious one, —"A point is that which hath no parts, no magnitude." You will better see its meaning if you consider how Euclid may have come to it.

Here is a wooden brick I have got in my hand. You see that it has length, breadth, and thickness. Each of these is called a dimension. The brick, then, has three. Suppose I plane away its thickness till it is all gone, then there will remain two dimensions, length and breadth—that is, the surface of one of the faces of the brick; again, in like manner, suppose the breadth be taken away, then only one dimension remains; length—that is, the edge of one of the faces. Now, suppose the length to shrivel up from one end till all the length is gone, what would remain?—no dimension at all. We should have just the *dot* of the corner of the brick.

This is Euclid's "point:" it is deprived of all dimensions; it has no parts, no magnitude.

From this he starts, and, travelling the opposite way to that we have gone, he gets first to a line, that which has one dimension, length ; then to surface, that which has two, length and breadth. By adding on thickness to the surface he would come to the solid or full brick from which we started. He does not do so, because he treats, in the first six books of *plane* geometry only, that part of the subject in which the lines are drawn on a plane or flat surface.

And here let us pause for a minute. I wish to say something to you, in a sort of parenthesis, which I hope may help you hereafter to understand two words that you will hear used to describe two different ways of reasoning.

We began with the full brick, and went back undoing it, taking it to pieces till we got to the "point." *Euclid*, on the other hand, begins with a point and goes forward, putting things together, adding on length, &c., till he builds up the full brick, that is, arrives where we started from.

Here you perceive are two different ways of considering the same question—the way of undoing, and the way of putting together. What do you think would be a good name for the way of undoing, of taking to pieces? does *ἀνα-λύω* describe it ? and for the other way, the way of putting together, do you think *συν-τίθημι* would be a good word for that ?

Well, if hereafter you hear two rather long

words, which you will easily trace to ἀναλύω and συντίθημι for two kinds of reasoning, think of the brick; perhaps it will help you to understand them.

Now, let us go back. Euclid wants a flat surface to write on, and how does he find out if his table is flat? I will tell you. He takes a straight line; we all know what a straight line is;—The edge of this ruler—carpenters call it a straight edge—is meant to be a straight line. If wherever this straight edge is placed along the table its edge lies exactly in the surface of the table (if there is no day-light between), then the table is flat, it is a plane surface. Here is a bit of warped board. My straight edge, though in some positions it may lie in the surface of the board, in others it does not do so; so the face of this board is not a flat surface, and therefore will not do for drawing the lines of *plane* geometry on.

But supposing our table flat and our rulers straight, draw now any two straight lines from the same point, in any direction you like, and tell me what have we got here?—An angle.—Yes, a flat straight lined, *i. e., plane rectilineal,* angle.

Now, what is the meaning of this word "Angle?" It is the inclination, the amount of opening between those lines. You will see plenty of angles if you look round the room [an octogan room]; all the different corners are angles; some are blunt, some are sharp; in fact, an angle is a corner, the

opening at the corner. What does Horace say of that cosy corner of his Tiburtine farm where he hoped to sit in his old age, and drink his Falernian ?—Angulus *ille mihi ridet.*

Remember, the size of an angle in no way depends on the length of the lines containing it. Here, as I open and close up the legs of my big wooden compasses, I make angles greater or less with the same straight lines; and here, give me one of your little brass compasses,—if I open it equally, with the large compasses, the angles are equal, though the legs are much shorter.

Plenty of time should be given to this matter—the meaning of an angle; and when the boys have learned how, by means of three letters, an angle is indicated in Euclid, a number of intersecting lines should be drawn on the black board, and while the Master puts his finger into the angles, the boys should indicate them by naming the letters; and conversely he should name the letters, and the boys should come up one by one to the board and put their finger into the angle named.

A Master will often be surprised how long it will take before the *whole* of a class of weak boys can do this; but he will be greatly helped in stimulating the slowest and weakest, by the hearty and not ill-natured laugh elicited by their bad attempts at hitting the angle named.

All teachers should assure themselves that

every individual boy has got over this difficulty. I have met boys professedly reading the third book of Euclid, who actually did not know the angle they were naming. No wonder Euclid is repulsive to such.

The same figure on the board will supply another exercise which should not be omitted,—the adding two contiguous angles, and pointing out and naming the single angle which they make when added together, also the taking one angle from another, and naming the angle that remains.

This is a greater difficulty with many boys than would be supposed, but it is a great gain when they can do it promptly; it helps them much in the winding up of the fifth proposition, and when they come to the seventh.

The three classes into which angles are divided, according as they are acute, right, or obtuse, are easily set before them, by the Master putting the end of his long ruler to the edge of his table, and making it slant more or less; they soon get to appreciate Euclid's test of a right angle.

Before drawing a circle with a pair of compasses, it is well to do it by the primitive mode of a tack in the black board, and a bit of string with a loop at one end to go round the tack, and a piece of chalk tied to the other.

The rest of the definitions offer no difficulty. It is better to pass over all reference to parallel lines at present.

With regard to the Postulates, it may be enough to observe you are allowed the use of a straight ruler and a pair of compasses. They are allowed you only that you may draw, and produce, straight lines, and describe circles, and *not to measure with*. It is better at present not to distract the boys by alluding to any deeper meaning of the Postulates.

The Axioms are readily taken in. Let them know that Euclid asks that they may be accepted without proof, *because he has no proof to offer*, that he proves everything he can. Of course, they will be told not to think about the twelfth axiom at present.

And now we have arrived at the first proposition. Let the figures of the first three propositions be drawn very carefully and deliberately; the boys will enjoy doing it. Let the equilateral
Fig. 1. triangle in the first proposition be drawn on each side of the line. In the second proposition let
Fig. 2. them join the point with each end of the given line. Vary also the relative positions of the point and the straight line, bring the point nearer and nearer to the straight line, let them see that the triangle thus becomes smaller and smaller, and guide them to feel what it becomes when the point actually coincides with an end of the line. Also place the point *in* the given line.

Fig. 3. In the third proposition, by all means let them do all the figure of the second proposition re-

quired for drawing AD equal to C; they had better do it in *pencil*, inking in the line AD; then let them efface all the pencil figure, and they have the figure as given in their Euclid books, and can proceed with the third proposition.

Boys like all this; they take a great pleasure and pride in it: they like to bring out neat and good figures, and it is all very instructive.

The demonstrations of the first three propositions are very simple, and there is this good about them, that the boys have the advantage of going three times over the same argument, with a little variety in details. But even here boys think there is something mysterious about lines, so that it is desirable to throw them off the rut of Euclid's phraseology and back on their own common sense.

And on Horace's principle that *Ridiculum acri fortius et melius, secat res,* we proceed in some such way as the following:—

At one side of the black board a few strokes represent the Tower of London. Near it we draw a soldier on guard,—soldier, musket, and all is done in a few strokes. At the other side of the board is drawn a round tower and a flag flying; this is Windsor Castle, and we place a sentry on duty there too. Now tell them these are two soldiers of the Grenadier Guards, one battalion of which is stationed at Windsor, the other at

the Tower, and there is a bet pending between these two men as to which is the taller. Unfortunately they are both on duty, one at Windsor, the other in London, and cannot therefore settle the question by the primitive method of standing back to back and measuring. What shall they do? The Windsor man has a comrade who measures with him; they find they are exactly of equal height. This comrade is not on guard, and gets leave to go to London. Then, midway between Windsor Castle and the Tower, a few strokes exhibit the train and the "comrade" inside. By the time we have drawn the scarecrow figure of the long-legged guardsman in the train, all are in a roar of laughter. Well, he gets to London, and measures back to back with the man at the Tower, and they find they are also of exactly equal height.

Now, the London man and the Windsor man know, *without measuring with each other*, that one is exactly of equal height with the other.

By what axiom it is asked: they answer, doubtless rightly, the first.

Now, then, says the Master, who of you can pick out, in each of the first three figures, the London man and Windsor man, and, above all, the man that went by the train?

In the best humour they all turn to their figures and look and think till, in a little while,

one after another, they all find out; and when they have all caught the man that went by the train, it is a great victory!

This done;—turn, says the Master, to the thirteenth proposition. I tell you beforehand, that the grand difficulty of that proposition is to see which is the man that went by the train. You are confused with the multitude of angles named, until you have discovered the man that went by the train, then it is all perfectly simple; and I here give you notice that when you come to that proposition, whoever finds out which is the man that went by the train, may claim an exemption. Make a note of that!

Now comes the tug of war: the fourth proposition, which is the key of Euclid. We tell them that the first three propositions are put in first, because in the fifth and sixth propositions we have to cut off, from a greater line, a part equal to the less; but that the real beginning of Euclid is the fourth proposition, the first theorem, and that on this proposition the battle with Euclid is to be fought, and the victory won.

From the beginning one cannot be too particular in pointing out the three distinct portions of each proposition—the enunciation, construction, and demonstration.

In drawing the figure of the fourth proposition, *Fig.* 4. it is wise to be very deliberate, and make a great to do about making the two given lines and the

included angle in each triangle equal, in order that the fact of their equality may be strongly impressed on the learners' minds.

Let each boy draw the AB and DE, and carefully, by his boxwood ruler, make them (say) two inches long. [If any sharp boy retorts, "You told us we were not to use our rulers to measure with," explain—this is only a *datum;* that it is for the *quæsita* they are not to measure.]

For the included angle, if a boy has learned the use of the protractor, and done a little practical geometry, (as he ought to,) he draws two lines equally inclined to the lines AB and DE; if not, let him bend a bit of paper or cardboard to any angle, and with its help draw the second lines AC and DF equally inclined to the first; and, by the boxwood ruler, let him make them carefully (say) two inches and a-half long.

Does this seem long and useless? I think it is highly important. It must be borne in mind that I have supposed a set of very weak boys before the Master. If he were to draw quickly the figures of two triangles, and say (as he might if he had more advanced pupils) we will suppose such lines and angles equal in each, and expect them to take in his words, he will be disappointed. I venture to say, if he names different lines and angles, and says was this and this given equal, or have they to be proved equal, he will find the boys again and again making bad shots; but all this care-

ful deliberation which I advocate helps them gradually to take in the idea, and till they know accurately what is given, and what has to be proved, they can make no progress.

It would be well at this point to take up the eighth axiom, and dwell on it and elucidate it: let them know that though in common parlance the words "same" and "equal" are used as if they had the same meaning, (for instance, we speak of two boys being of the same height, of two masses being of the same weight, when we mean they are of *equal* height and *equal* weight,) the words are not confounded in Euclid: when he says *the same*, he means the *same identical*.

He says, we know two magnitudes are equal, if we know, if we can assure ourselves, that they fill the very same identical space. Elucidate, by supposing the boy you are addressing to be casting bullets: he casts one out of the mould, then he casts another out of the same mould; there they are lying side by side; is he sure that they are equal? yes, why? because he knows them to have filled the *same space*, the same cavity of the mould in which they were cast.

It is good, here, to get a promise from each boy that they will not say that any two things which they want to prove equal are so, until they have first shown that they fill the *same* space.

We then begin with Euclid's ideal superposition: place A on D and AB on DE. Where,

then, will B naturally and of necessity fall, and why? Some will have difficulty in answering the question; they are frightened at the phraseology of geometry. Draw their minds, then, to some homely illustration. Here are a couple of walking-sticks, a long one and a short one. I lay them alongside of each other. I bring the handles together; say, will the points come together? No. Why? Because one is longer than the other. Quite right. Here are a couple of equal length; I do the same with them. *Now*, do the points come together? Yes. Why? Because one stick is as long as the other. Quite right again.

Now, says the Master, let us go back to the lines; consider them to represent walking-sticks; and remember, AB was given equal to DE. Now, then, if you place A on D and AB along DE, will B come on E? Yes. Why? Because they are equal. Quite right, admirably said. You have got over one-third of the difficulty of the main part of the proposition.

Now, these lines AB and DE lying together, where will AC naturally and of necessity lie, and why? Here it is well to have three triangles at hand in cardboard, which have two sides in each respectively equal, the included angle being in two cases equal, in the third case unequal. Place them together as directed, bringing together alternately the triangles which have unequal and equal included angles. Thus the pupil will be brought to

feel the reason why AC will lie along DF. Two pair of compasses will do as well.

And AC now lying along DF, will the point C naturally and of necessity fall on F? Yes. It is hoped this time he will say firmly, "Because the lines are equal."

He should now be called upon to give the three consecutive steps of the reasoning. If he does it correctly, he may deservedly be patted on the back; for out of a hundred boys that come to Eton professing to have read Euclid, not one can do as much.

Now, take every boy consecutively, and make him try to say the same three steps of the proof. A Master will find comparatively few able to do so, even after the foregoing explanation. He must be ready to repeat and vary his illustrations; also by going round and round till each boy can say it, one will teach the other, and the desire to be classed with the successful will be a stimulus that will help the poor weak fellows to fix their thoughts. At last, we may suppose they have all succeeded in saying this much, right.

Now, call a pupil up to the board, and ask him where B now lies. It is ten chances to one that he will point to the letter B on the board. *No*, the Master cries energetically—and he dashes a couple of chalk marks across the triangle ABC, saying, ABC is not there; it's lying on DEF. Now, try again. Where is B? He puts his finger on E;

and Where is C? He puts his finger on F. Quite right now, observes the Master; you have shown that the two lines BC and EF begin together and end together. Now, answer me this. Beginning together and ending together, as they do, can they separate at all between the beginning and the end?

If they do not take in the meaning of this question, and possibly they will not, they might be helped thus :—

The Master might take up a couple of pens, and bringing the points of the pens together with one finger and thumb, and the feather ends together with the other, he might say, Here these two pens begin and end together, but they don't keep together; they separate. In fact, they enclose a space, don't they? Put your finger into the space they enclose. How is it that they enclose a space? Because they are not straight. Exactly so, and if they were straight lines, they could *not* enclose a space. Is not that just what Euclid says? Here are two straight pen-holders; if I bring the beginning and end of these together as I did the quill pens just now, they do *not* enclose a space, but keep together from beginning to end.

Now, these two lines BC and EF are supposed to be straight lines, and you have shown that they begin together and end together.

Say now, do they separate like the pens, or keep together like the pen-holders?

They all answer promptly and rightly *this* time. The Master now tells the boy whom he has called up, to draw his finger along the space filled by EF; he does so; And again to draw his finger along the space filled by BC; he draws his finger along the same space. Right, and you have discovered (he adds) that the two lines fill the same space, *i. e.*, so much *length*, you need take no account of their breadth because *lines* have not any.

Now, let us look back and see what we have done. We have shown that if any two triangles have two sides of the one equal to two sides of the other, each to each, and have likewise the included angles equal,—and that if one of the triangles be applied to the other as a *triangle of any form whatever might be applied to any other*,— THE TWO BASES WILL OF NECESSITY FILL THE SAME IDENTICAL SPACE.

Now, turn to your eighth axiom and read it. "Magnitudes which coincide, that is, which exactly *fill the same space*, are equal."

What, then, can you now say of BC and EF? That they are equal. Quite right, well said.

After a minute or two's rest for breathing, the lesson is resumed.

Now, tell me, where does AB lie? On DE. How do you know? He hesitates. The Master passes on the question. At last, one, a little clearer or bolder than the rest, ventures to say, "Because we put it there." Quite right. A very

good and sufficient reason, we put it there. Shake hands for that. And where does BC lie? On EF. How do you know? If he is very bright he will say, "We have just proved that it must come there," and the Master may well say, "Capital." If he does not see the right answer, he must be led on to it.

When he sees this, the Master says, Now put your finger into the space filled by the angle ABC, now into the space filled by DEF. He puts his finger both times into the same space. So you have discovered that the angles ABC and DEF both fill the same space. And as they fill the same space, what does the eighth axiom tell you? That they are equal. Right again.

Now, once more. Where does AC lie? On DF. "How do you know? Don't say because we put it there." No, but we put AB on DE, and we proved that, in that case, AC *must* come on DF. A triumph! you deserve exemption for that. Of course, you know where BC lies, you have already told me. Now put your finger into the space filled by the angle ACB, and now into that filled by DFE. Twice again he puts his finger into the same space. So you have discovered for the third time that the two things which you wish to prove equal (that is, the second pair of remaining angles) fill the same space.

How do you finish? Therefore by the eighth axiom.....The pupil finishes the sentence by say-

ing, "They are equal." Right again. "You are going ahead—one 'bout more, and you're safe in port!"

Once again, then, where was it you put AB? On DE. And where did you prove AC would come? On DF. And where did you show that BC must lie? On EF.

Now, then, put the flat of your hand into the space filled by the triangle ABC, now into the space filled by the triangle DEF; twice he puts the flat of his hand on the same space. So you have for the fourth time made the discovery that the two things you want to prove equal (now the two triangles) fill the same space, and, therefore, by the eighth axiom.....in tone of sympathetic triumph, the pupil takes up the word, and adds, *the triangles are equal.*

You have thus proved, *in accordance with Euclid's eighth axiom*, that if two triangles have two sides of the one equal to two sides of the other, and have the included angles also equal, *they are equal in every respect.*

This is the grand fourth proposition. It is, as I said, the key to Euclid. I congratulate you on what you have done. Go now to your place, read over the proposition, as it is written out in Euclid, once or twice, carefully, then close the book and write it out, while I take another boy in hand.

I have here imagined a very fair (a far too fair)

specimen of an average pupil. A Master must not be disappointed if he has to lead a boy on and encourage him many a time, before he wins the victory. Many and many a time has a boy said to me, "AB lying along DE, AC will lie along DF, because AC is equal to DF." And I have had to answer, "My dear fellow, there is exactly as much sense in what you have now said to me, as if you were to tell me it is twenty-two miles to London, because butter is eighteen-pence a pound."

Boys are most apt to say words without attaching a meaning to them. This is often found to be the case where it would not be expected. They must be shaken out of the habit, and this is exactly one of those things that Euclid when properly learnt does.

I remember once hearing a boy saying the proposition thus :—

Because AB is equal to DE, and the angle BAC is equal to EDF, therefore the line AC lies on DF. *No, no,* said I. What ought he to say? The next boy answered. Because AB *lies* on DE. A little fellow sitting by the side of the speaker (he is a post Captain in the Navy now) looked up eagerly into my face and said, Will you tell me why it is not as good to say it one way as the other?—"Do you wish to know why? I'll tell you willingly."

Look at those two triangles on the black board,

ABC and DEF. Remember AB and AC are respectively equal to DE and DF, and the included angles also. Yes.

Now, if I were to take a saw and cut down through the board between the two triangles, and were to send one-half of it, that on which the triangle ABC is drawn, to Oxford, and the other, that on which DEF is drawn, to Cambridge, the lines and angles would still be equal, would they not? Of course. But if one of the triangles was in Oxford and the other in Cambridge, could the line AC lie on DF? Of course not.

But if the triangles are neither at Oxford nor at Cambridge, but there on the board before us, and I conceive the triangle ABC to be laid on DEF, laying A on D, and AB along DE, then indeed AC *will lie along* DF, because the included angles are equal.

A rich, deep blush forthwith suffused the boy's ingenuous countenance. "Thank you, sir," said he; "I see it perfectly now,—I never saw it before."

When the whole class have been thus set on the right tack for appreciating the demonstration, and by their own efforts have mastered it, and shown themselves able to produce what they know *by writing it out correctly*, then follows another exercise most interesting and instructive. The aim of it is to show the application of the fourth proposition.

But it is high time the class should have a

little rest, and while they are resting, I should like to have a little talk with my readers about all this.

Will one of those friends who have been reading these last pages feel ready to exclaim, "What labour, what misdirected effort have we here! all this work to prove (in subjection to an artificial test of equality) an axiom! for the fourth proposition is nothing else!" "My friend," I answer, "let me speak as a Schoolmaster. Euclid is the book which the traditions and the general consent of the country put into our hands, and my business as a Schoolmaster is to try and make it do what it is put into our hands to effect. Now, what do I find, by experience, is the result of this mental ordeal I have been describing? I reply, confidently, the boys come out of it intellectually changed. They are lifted into a higher mental level from that in which they stood before, never to descend again into it as long as they live." After this *badgering* (it might be called, if there were not a perfectly good understanding on both sides) on the fourth proposition, there is comparatively no more difficulty in Euclid. Henceforth they take kindly to it; they *will* know the meaning of what they are doing. They never think of learning a proposition by rote. It is too much trouble; there is no pleasure in it; but there is very great pleasure in understanding it.

The sort of mental activity that is henceforth

evoked by Euclid, and the satisfaction of the Euclid lesson, I can best illustrate by referring to the actual facts of those weekly evening Euclid lessons of last school-time with the class of St. Mark's boys that I have alluded to. I can speak more freely of them than I can of others.

When we had come to the third proposition of Book III., I told them of a mistake which had been made by some great men* in a mathematical examination, who tried to prove the second part of the proposition by the B.I. 4., and I asked them to explain where their mistake lay. They did so. One of them, however, observed, "But it might be proved by the fourth." "How so?" "Because two of the angles of each of the triangles are equal, so by the thirty-second proposition the third must be, and that is the included angle." Another of the lads here interposed: "It might be proved by the forty-seventh proposition."

* I am afraid these "great men" here spoken of were none other than the scholars of Trinity in their fellowship examination. When I was trying for a fellowship, (which I did not get,) one of the examiners told me that all the candidates but two had made this mistake. Now, the story is so valuable for making boys give an intellectual spring, for giving them what the French would call *elan*, that I am afraid it often does duty in my class-room. So I must here humbly apologize to that most select and respected body of men the scholars of Trinity, and ask them, "for a great good," to let me "do them a little wrong?"

There is not much in this; but it shows mental activity, and an appreciation of Euclid. The study cannot be repulsive to boys who have this kind of knowledge of it, and can link on readily one proposition to another; and I can assure my readers that as I led them on to discover for themselves the different unexpected properties of the circle, which Euclid brings out in admirable continuity in the latter half of the third book, so entirely interesting was the exercise, that they could hardly refrain from a cheer of satisfaction at the winding up of each proposition.

Come here, my friend, and stand by my side. Look into those boys' faces. They are merry-hearted boys; they laugh like others, and sing (that they do, and sing very well too!) Look at them now. Mark the fixed eye—the rivetted attention—the animated countenance—the smile of satisfaction—they are not conscious of all this, but you and I looking into their faces can see it. What, I ask you, is all this the sign of? The interest and internal pleasure felt in the exercise of the mental faculties in the following out intellectual truth.

Give me then your sympathy, my friend, and tell me if you do not think that Euclid is doing them a great good.

I could speak of others besides St. Mark's boys, and say what pride I have in finding myself surrounded by boys in whose minds has grown that

grand capacity which Euclid emphatically imparts, "the capacity to know when they know a thing, and *to know when they don't know it.*"

I rejoice to see them reject an explanation if they do not see their way to link on all that is said, from sentence to sentence, in a manner satisfactory to themselves.

I rejoice to see their quickness at putting their finger on the weak or obscure point of an explanation. I rejoice to be pinned down by them by a searching question. "Why is this? You have not explained that."

But we must leave this. It is time to go back to the Euclid. We left the pupils resting; but they were only half through the battle.

To appreciate the fourth proposition the learner must know, not only its demonstration, but its application. Of course, the fifth and sixth propositions are exercises on the fourth; but it so happens that they are particularly hard exercises.

There are a number of far easier ones scattered about Euclid, if only it were permitted to take a few things for granted, which they have no difficulty in doing; for instance, that an angle may be bisected, and that a perpendicular may be drawn from a point in a line. (If they have done any practical geometry, they have learned how to do such problems,) then very easy exercises on the fourth proposition may be found in Euclid (*e. g.*, the tenth prop.)—or framed. *Figs.* 5, 6.

Again, if we assume that on opening a pair of scissors the angle between the blades is equal
Fig. 7. to the angle between the handles, then the sixteenth proposition furnishes an exercise. If we
Fig. 8. write a figure like a Z on the black board, and assume that the angles in the knees of the Z are equal, then the thirty-third is an exercise. If we
Fig. 9. assume that a square may be described, the forty-seventh furnishes a capital exercise.

And if they are told that all these things, which they are asked to take for granted now, will be regularly proved hereafter, no harm is done.

The two triangles to be proved equal being set before the pupil, he examines them and finds out for himself the two sides of the one that are equal to the two sides of the other, observing that the equal angles in each triangle must be those that are contained by the respectively equal sides ; then he writes formally out the exercise in five lines or paragraphs :—

1. He names one side in each triangle that is equal, giving the reason why.

2. He names a second side in each that is equal, giving the reason why.

3. He recapitulates,—wherefore the two sides named of the one triangle are respectively equal to the two sides named of the other ?

4. He names the included angles, and gives the reason why they are equal.

5. He concludes, therefore, *by the fourth pro-*

position, the triangles are equal, in every respect, naming the respects if necessary.

It is hitting a nail on the head that drives it home, and that is just what these exercises do. After doing two or three of them, they get quite clear and brisk. They enjoy the exercise. They examine the triangles; pick out the sides; write out the five formal paragraphs; come up with it. It is examined. Right. Off they are to do another. One hears occasionally, in a tone of triumph, "Therefore, by the fourth proposition," &c.

The last exercise is always that crucial test, the second part of the third proposition of the third book, and the scholars of Trinity do duty again and again. *Fig.* 10

Now, among these exercises, we introduce the following in an off-hand way, without letting the class into the secret of what we are about.

Draw, says the Master, a couple of circles, with the same centre one inside the other; and draw now a couple of radii (two spokes of the wheel) to the rim of the outer circle; call them AD, AE; put B and C where these lines cut the inner circles, join BE and CD. Now take as an exercise to prove that the triangles AEB and ADC are in every respect equal, and name the respects. They set to work; in two or three minutes they bring up the exercise, the five paragraphs written correctly out. *Fig.* 11.

Then the Master says, Now join BC, and,

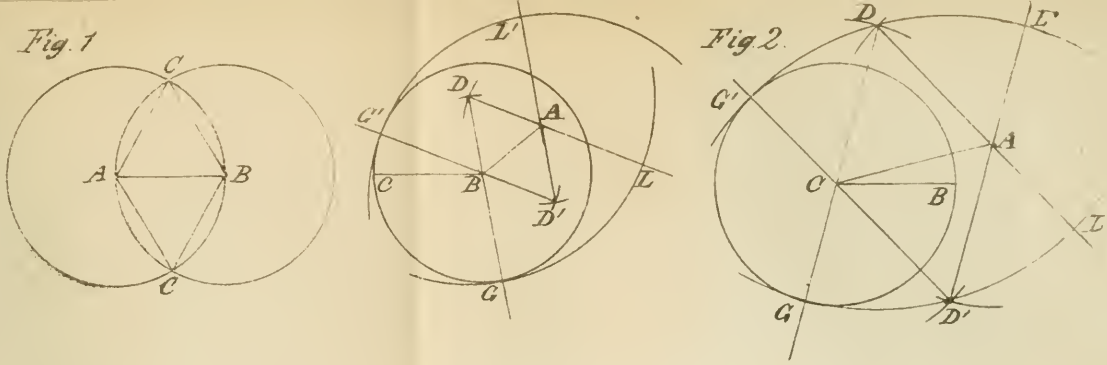
remembering what you have proved already, try and prove that the triangles DBC and BCE are also equal in every respect, observing to them that the bases of both triangles are the same line.

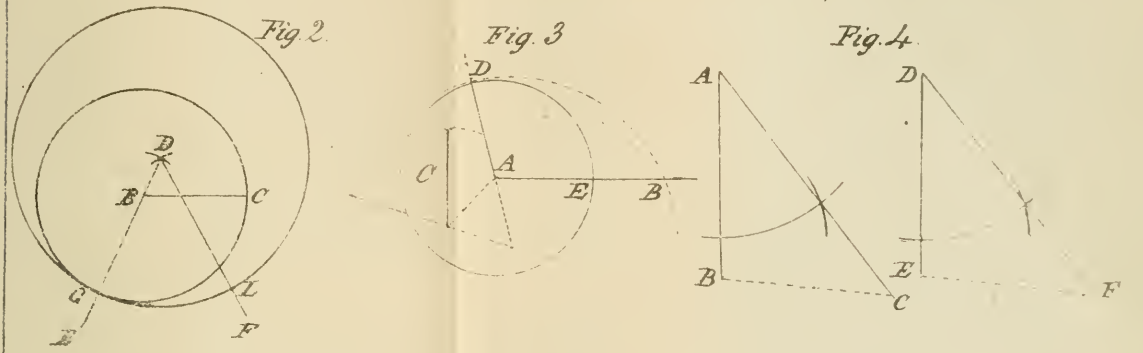
Down they go to work, and this exercise is brought up in a few minutes.

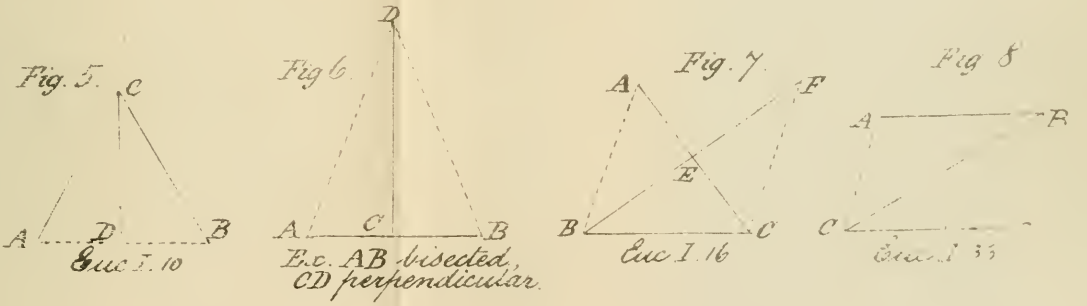
Then the Master again quite casually says, Let me see, we proved these big angles ACD and ABE to be equal?—Yes, say they, in the first of the two exercises. And we have just now proved that BCD is equal to CBE?—Yes. Suppose we take these little poky angles from the big ones. Then ABC and ACB remain; And if equals are taken from equals, what do we know about the remainders?—They are equal. Exactly, then what angles are equal? ABC is equal to ACB.

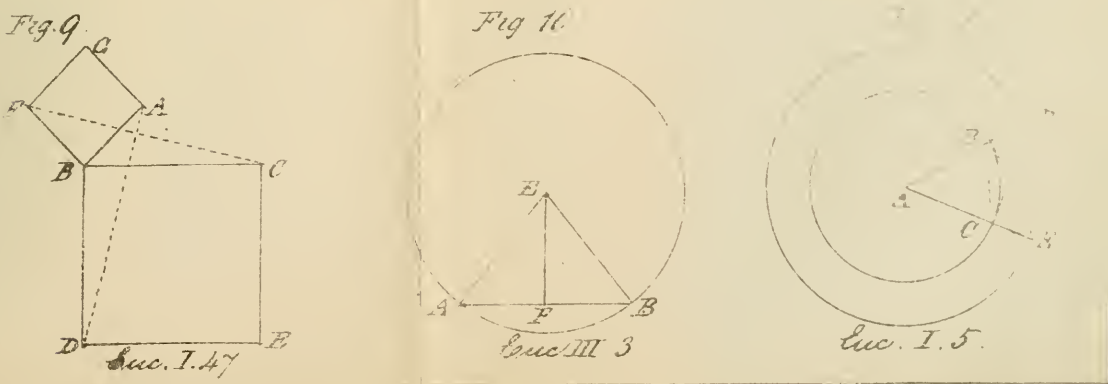
The tutor's face, which has been solemn and somewhat constrained all this time, now relaxes into a serene smile of triumph and congratulation. "Gentlemen," says he, "I have the pleasure to announce to you that you have done the fifth proposition. The 'Bridge' is passed." They are taken aback. "Quite true. It's all over! The tooth is out! It's all right!" So, then, we are all very happy together.

In doing these exercises with the boys, I have had reason to admire Euclid's judgment in speaking of the two sides and the base of a triangle, instead of talking, as we very commonly do, of the three sides of a triangle. To observe which









H. PEACH _ Fecit

lines are the bases of the triangles to be compared is a great help to learners. One boy to whom I gave the sixth proposition as an exercise on the fourth, without, of course, telling him it was a proposition of Euclid, came up a little baffled, and scanning the figure, he said, "Which are the bases of the triangles we have to compare?" "A capital question!" was my answer. "Shake hands." I put him on the right tack to find out for himself. He picked them out. "I see," he said; and he went down to his place, and wrote out the exercise (really the proposition) at once perfectly right.

After this we turn to our Euclids: they read over the fifth and sixth* propositions, paragraph by paragraph, and then write them out carefully. These exercises are not intended to supersede the careful writing out of Euclid. The appreciating and falling in with Euclid's guarded choice diction I hold to be a great intellectual benefit. It is a help to those who wish their knowledge to be clear and precise, and I cannot think it is lengthy. Very often, when with a little oratory and emphasis, suiting the action to the word and the word to the action, I have gone over a proposition for a class at the black board, they have said to me, "Is that all? we can understand that, but there is such a lot of it in Euclid." Then I

* I do not find that they have any difficulty in taking in the idea of the *reductio ad absurdum* proof, if clearly put.

take a Euclid in my hand, and say, "You fix your eyes on the figure on the black board, while I read the proposition in Euclid *verbatim et literatim*, and you will see if there is anything in it that I have not said; also, you will tell me if it can be shortened, and where." At the end of the reading they are always satisfied that the wording of the proof is only what is needed for completeness and precision.

They might go a-head now as μύσται, but I generally take them by the hand,—keep the belt round them, till they have reached the eighth. After that they swim off by themselves.

So to complete my sketch, I will give a rapid outline of our teaching the seventh and eighth. We always teach them together "without solution of continuity."

The seventh, I frankly tell them, is a teaser. I like to do so, it puts their courage up. I add, it is a proposition introduced only to prove the eighth, which is a most important proposition, as valuable as the fourth, but the seventh is never used again.

I tell them that some schools are afraid of the seventh, and, explaining to them what is wanted to be proved in the eighth, I guide them to show me the proof that is given of the eighth (as a simple deduction from the fifth), in schools where they are afraid of the seventh. "But *you* are not afraid of the seventh?" No!—Let us go at it then.

I find it simplest to put the enunciation in this form. If the two sides terminating in one extremity of the base are equal, those terminating in the other extremity must be unequal. Then we proceed step by step, in the way of questions, from the equal angles at the base of the isoceles triangle to the "Much more then...." Some boys have a great difficulty about the *à fortiori* argument. We have a familiar illustration which has often proved a great help to boys.—You agree that a father is older than his son? Yes. And that a grandfather is older than the father? Yes. Much more must a grandfather be older than his grandson. Now, then, in the seventh proposition pick me out the father, the grandfather, and the grandson. They do it after a little, and the difficulty is got over, and they go on at once to the eighth, see its connection and take it in. In fact, the coinciding of the angles is no difficulty to them after the drilling they have had in the fourth proposition.

The work is done now. Those who have succeeded in mastering the eight propositions, and have answered our questions* upon them, and

* One of our methods is to turn the eight propositions into a series of questions (they make upwards of a hundred); to these we get written answers. I had thought of putting our questions into an Appendix to this Essay, but it is not worth while. If any teacher of Euclid who reads these pages would like a copy of the questions, he is heartily welcome to them.

have written them out correctly, get their pass: they are μύσται. And to them I say: "Now, if you like to ask, what is the use of Euclid? I will tell you." But, no! they are too pleased and proud to ask the question. Besides, they have felt internal satisfaction in completing a geometrical demonstration.

These are formed into a class of honour-men; they go on by themselves, learning their four propositions, and writing them out each time they come, while the Master goes over the same ground a second time with those who have not conquered.

In this second going over the ground, with the weakest boys, we find that the patent fact that some of their companions have conquered, and the exalted honours which they enjoy, are a great stimulus to the less successful. Many a time I hear a little tap at my door—"Come in," and the face of one or other peeps in, asking for a little private teaching in play-hours, that they may get their "mystic" honours. When all have passed, we can form ourselves into a class again, and sometimes we lecture, sometimes write out Euclid, sometimes do exercises. (And here I must say that Schoolmasters are under great obligation to the modern editors of Euclid for the carefully graduated exercises which they have appended to their Euclids.) And the work is all pleasant.

I have now said my say on teaching Euclid, and

happy shall I be if any hint of mine in these pages shall help any Schoolmaster to some of the brightness and sunshine which teaching Euclid has been to me for these many years back.

I must now bring my Essay or Narrative to a close.

I have been reading over Mr. Wilson's essay again. I do not think we are far apart in view. I hope not. No reader of his essay can lay the book down without feeling that Rugby is most fortunate in having such a teacher of natural science, and that, whatever can be made of it, he will make of it; if the study of natural science can be prevented being cram, he will prevent it; if its votaries can be saved from sciolism, he is the man to save them. But even he, I think, will say that if Euclid can be made attractive instead of repulsive, and I have tried to show that it can, then the boys who are imbued with geometrical conceptions and reasoning will pass on to mechanics, which he judiciously places foremost in the course of natural sciences, much more profitably than those that are not. I do not speak as a novice. I have before me papers on experimental mechanics, hydrostatics, and explanatory astronomy, which I set to my pupils at Eton in the year 1836-7 (and, I may add, the actual marks got in the examination by the late Head Master of Eton, Dr. Balston, then my pupil). Now, while the Euclid and the non-Euclid boy will both enjoy

the models equally, the Euclid boy will be at home in the parallelogram of forces in a manner that the other will not be. The figure and its properties are strange to this latter one; you have to be leading him on with hesitating steps, and slow; he does not see his way. The boy up in his Euclid, on the contrary, when you put before him the principle of the "parallelogram of forces," takes it in at a glance; he sees directly what it must lead to. This is not a fancy. In answer to the question from one of my pupils, "What is the meaning of the parallelogram of force?" I drew a parallelogram on his paper, and, in a few words, answered his question. "How jolly," said he, rubbing his hands. "Oh, *do* teach us that!"

And with a little knowledge of trigonometry, founded on the second book of Euclid, how soon is a boy at home in the triangle of force, and the composition and resolution of forces. How many easy, entertaining, and most instructive problems is he prepared to do. It is not to be doubted that one who has read Euclid will bring conceptions, and a mental training, and a knowledge to the subject that will make it far more profitable to him than it will be to the other.

So, in explanatory astronomy, that most instructive and elevating subject, often have I tried by paper triangles and models to make people, untrained by Euclid, realize the greatness of creation, and comparatively in vain. There is a

haziness of view, an indefiniteness in their conception that one cannot get over; the matter does not seem to come home to such; but take a set of boys that are well up in their Euclid, who have a clear understanding about the nature and properties of triangles, to whom the thirty-second proposition is a truth known, felt, and easily applied. Carry them gradually on from a base measured on the earth's surface to find the distance of the moon, up to the fact that a base of 190 millions of miles shrivels to a point in comparison with the distance of the fixed stars, they take in what you say, and listen with wonder, and (I can say so, for I have seen it) with breathless awe.

I wonder and should very much like to know if such charming books as "Herschell's Astronomy," his "Familiar Lectures on Scientific Subjects," or "Airy's Ipswich Lectures," are read to any extent with interest and profit by any except those whose minds are imbued with and trained by the conceptions and reasoning of plane geometry.

Before I close, I would say a word about Foreign Schools for the middle and lower classes; at least, as far as they have come before me.

Last summer, in Switzerland, I learned from my Swiss Guide, that there was an excellent pensionât at Sallenches, under the direction of the Frères Chrétiens; that the numbers of the school had

doubled and more, within a year; that, standing on its own merits, it had gone far to empty the Government College at Bonneville, which received a large subvention from the State. My guide had a son at the school; he was going with his wife the next day to the *distribution des Prix*, and to bring his boy home for the holidays. I asked leave to go with him; and the next day I accompanied him and his wife in their char-a-banc to Sallenches. He introduced me to the principal, clearly an able man. I had also much talk with the Professors and the boys. I was present at the closing ceremony of the year, heard their brass band, listened to their glees and songs, heard their pieces recited, saw their little plays acted, and through the local knowledge of my guide, got the names of those who appeared the most promising and successful pupils; of those, at least, who carried off the greatest number of that inexhaustible stock of chaplets and books, that are distributed on such occasions at French Schools.

It was a very interesting meeting, and I greatly enjoyed it, though Dr. Balston would have been surprised and amused, if, in the course of his Swiss rambles last summer, the local paper of Sallenches had fallen into his hands, and he had read as follows :—

"Nous devons mentionner un Suffrage non moins précieux que ceux de l'assistance toute entière. Un étranger, venu du Village de St.

Gervais, montrait dans les rangs de l' assemblée sa tête vénérable, et semblait écouter avec plus d'interêt que tous ses voisins, ce qui se disait dans la salle, ou sur le petit Théâtre improvisé. C'etait le Révérend Hewtrey, directeur du célèbre Collége d'Eton en Angleterre."

I found that some of the most promising pupils were living up the valley of Mont Joye, where we were staying, and as they were now dispersed for the holidays, I found them out in their mountain homes, and had most friendly and familiar communication with them. They showed me their cahiers, and explained the methods of instruction pursued at their school. In fact, they gave me a dozen or fifteen of their school cahiers filled during the last year, and very neat and tidy they are.

Among them are books of drawing, both ornamental and geometrical, indeed, their geometrical drawing is first rate; their plans, sections, and elevations, of all kinds of objects, even of complicated pieces of machinery, are perfectly astonishing; so much so, that I went, when passing through Paris, to the great depository of the Frères Chrétiens, in the Rue Oudinot, and got a large case of their models and appliances for teaching practical geometry and geometrical drawing, for the use of St. Mark's. (They had carried off the Gold Medal at the Great Exhibition.) Besides their drawing books, there were cahiers of Book-keeping, Arithmetic, the common working of

rules, and rather complicated questions and problems, Composition, Information about common things, some facts of Natural History, a little French grammar, and Physics.

The contents of the cahier on Physics seem to have been given by dictation from a text-book. They consist mainly of definitions in graceful sonorous French phraseology of the properties of matter: Molecular attraction, cohesion, affinity, porosity, elasticity, vis-inertiæ, specific gravity, force, &c., &c.

Whether or not the boys took in what they wrote down, I cannot say. My knowledge of boys' minds would lead me to fear that it was all sound to them and nothing more; and I have high authority for my doubts; "*τὰ μὲν ὀυ πιστένουσιν οἱ νέοι ἀλλὰ λέγουσι,*" says Aristotle.*

And if what they wrote down was not taken in, digested, and assimilated, what was it to them? I fear that for one Rugby *chef*, who can lay before his pupils an intellectual meal on physics really nourishing and *appetisant*, there will be found a hundred inferior artists who will give their pupils nothing but—*beans!*

* The whole sentence from which the above few words are taken is very worthy of attention in this day; it occurs in the Ethics vi. 8:—

Ἐπεὶ καὶ τοῦτ' ἄν τις σκέψαιτο, διὰ τί, μαθηματικὸς μέν παῖς γένοιτ ἄν· σοφὸς δὲ ἢ φυσικὸς ὄυ. Ἢ ὅτι τὰ μὲν δι' ἀφαιρέσεώς ἐστι· τῶν δέ, αἱ ἀρχαὶ ἐξ ἐμπειρίας; καὶ τὰ μὲν ὀυ πιστεύουσιν οἱ νέοι 'αλλὰ λέγουσι· τῶν δὲ, τὸ τί ἐστιν ὀυκ ἄδηλον.

I had much talk with the boys about their school, and their work. They recited to me some of their pieces, and translated into French the *patois*, in which some of them were written, and explained the jokes, which had called forth the hearty laughter of the audience on the speech-day.

On the other hand, I talked to them of what interested me. I told them of St. Mark's, and when they were gathered round me, I told them the affecting story of our little African boy (see Appendix E). They were greatly interested in his history, and asked how he was getting on. I told them very well; and, though it was not two years since he was living in a savage country where he had never even heard of a white man, he was now able to read and write. I showed them a letter I had received from him; they scanned it with interest, and especially the signature, "James Chala Salfey," for so he had been christened by the Bishop of Cape Town on his way to England.

"Mais il n'écrit pas aussi bien que vous, Henri," said I to an intelligent boy among them named Henri Révenaz. "S'il eut appris aussi longtemps peut-etrê qu'il écrirait beaucoup mieux," was his answer. Another day the same little fellow came to me, saying, "Le petit nègre, quel âge a-t-il?" I said we could not tell—perhaps ten; but I would send him his photograph.

I mention all these details to show that they were not at all shy with me or constrained. We had a good deal of very pleasant intercourse during the ten days I remained in the valley, and I got to feel a very great regard for them.—(*See* APPENDIX F.)

To return now to the Sallenches School. Here is a very favourable specimen of a French School, with an able Director at its head, and with such a character, that I found it drew scholars from so great a distance as Lyons. On the other hand, there is St. Mark's. The Schools are for about the same classes of the community; the French School is, of the two, for the higher class.

The course of instruction at both Schools is much the same, with one exception—that the French School stops short of Latin and Geometry as a science, and, of course, devotes more time to other branches of Education, especially those immediately bearing on the boys' future occupations. The question for decision is this, Do the Latin and Euclid of St. Mark's leave their seal—their *cachet*—on the boys, so as to allow of no doubt as to their being thoroughly worth the time and effort which they demand? I hope my readers will give me credit for sufficient sincerity and largeness of heart to be a fairly unprejudiced judge when I answer, "Most decidedly they do."

There is a strength, a nerve, a development of mind—a kind of completeness of mental training

—a difference of intellectual level in the St. Mark's boys as compared with those of the French School, which make me more than ever sure that there is nothing like Latin and Euclid if you want to produce "well-developed minds, ready to turn with ease and vigour to any special pursuits."

I trust that no one will think that in saying this, I am bearing hard upon a poor school that cannot speak for itself. Far be it from me to do so. The school and the scholars greatly interested me.

But, if my readers will call to mind the struggle with Euclid of a St. Mark's boy, and compare with this the copying out definitions of the properties of matter couched in language which a boy could not, I think, understand, they will feel that it must be as I have said.

I am not drawing invidious comparisons; what I say is prompted solely by the desire that my fellow-countrymen may feel what is the more excellent way, and take it.

Such are the thoughts that I have to offer on the topic of the day.

It will be seen that, while giving in some detail an account of the attempt to give a Liberal Education to boys of the working class, I have wandered at times into the history of my Eton experiences, so that the two have become as it were intertwined.

I am not sorry for this. Those who think deepest will take it, I trust, as a sign of the truth of the principles of Education advocated, that they are found to suit equally the highest and the lowest class ; and those who are now interested in establishing schools for the middle class may conclude, *à fortiori*, that they will work beneficially with that class also.

And so may we approach that happy time when the healthiest of all bonds shall connect the whole of the great English family; that is, when the same principles shall be at work through all the gradations of society, from the highest to the lowest, to reach the heart, enlighten the mind, and form the character.

The cry that resounds at the present day is this,—"The great extension of Political Power renders the extension of Education necessary."

I appeal to my readers whether the truer view of the question,—whether the cry that should have resounded years ago,—is not this ? "A great extension of political power is coming and must come, and, therefore, our country must be prepared for it by judicious Education."

This was the principle, I can safely say, on which St. Mark's was founded, so much so, that from fifteen to twenty years back, it has been pleasantly called, within the sphere in which its operations are known, the School of the coming age.

In its principle and details, it was founded in anticipation of a time coming, when in religious matters the being imbued and formed by the Gospels would be the stay and defence of the soul amidst religious doubts and perplexities; and when, in a political and social aspect, the strength and well-being of the country would be best secured by the more prosperous classes holding frankly out the right hand of fellowship, and the less prosperous grasping it firmly and without suspicion; in order that, thus united and mutually supported, all should stand together.

The writer cannot here forbear to adorn his page with the description of this most happy time—most blessed state of things, given by the gifted editor in his preface to that Book—prized and cherished by the country—in which Her Majesty has been pleased to admit her people within the sanctuary of her thoughts and feelings.

His words are as follows :—

"Nor does any wish more ardently than Her Majesty, that there should be no abrupt severance of class from class, but rather a gradual blending together of all classes, caused by a full community of interests, a constant interchange of good offices, and a kindly respect felt and expressed by each class to all its brethren in the great brotherhood that forms the nation."—(*See* Appendix G.)

The School in which it has been the writer's

aim to exemplify the working of these principles is before the world. It has been long in action. Many, far and wide, have evinced deep interest in the success of the experiment. The men whom the system has formed are scattered about the country, doing their work in the different classes of the community. "They are our epistle, known and read of all men."

I do not say that none of them disappoint us. I have, indeed, heard not long ago of an instance which has given me sorrow. But by the *general* character of the St. Mark's men, by the way in which they are doing their duty in life, by the specimens of Englishmen they form, I wish the system I uphold—of giving a Liberal Education to the working classes—to be judged.

And now, in closing, the writer would say one word as to the *character* of the Liberal Education advocated in this Essay.

It may not be according to the ideas of the most advanced writers on the subject; on the other hand, readers of the foregoing pages will not imagine that he wishes to throw any hindrance in the way of the growth of Education, and of the Social Progress of the country. All he wishes to do is to warn those who are ready to give up the old ways, and are somewhat nervously casting about for new methods, to be careful that they do not unawares throw aside engines of intellectual and moral value, endangering thereby

some of the characteristics which we prize in Englishmen.

For himself, after being upwards of thirty years in the work, he must feel that his time must be approaching to its close, and he would as a last word urge on those who will have in their hands the charge of guiding the Education of the next generation, "To prove all things, and to hold fast that which is Good!"

FINIS.

APPENDICES.

Appendix A.

I was exceedingly amused last school-time when hearing the "Gentil-homme bourgeois," inimitably acted by Frank and Henry Tarver, and their pupils, at being reminded that Molière ridicules as arrant pedantry what we have practised in all seriousness. I mean the custom of analysing how the different vowel sounds are produced, and how the consonants are articulated. I think Molière has here let his wit run away with his good sense. We find it to be an admirable exercise, and very amusing to little boys.

When you tell them how this or that articulation is produced, you see each boy testing the rule with his own tongue, lips, and teeth. It is also the best corrective I know for provincial mispronunciation. And how often have I seen a non-scientific teacher teasing a young child by telling it to say *cat*, not *tat;* how much better, and more instructive, to tell the class that the hard C is produced by raising the middle of the tongue towards the roof of the mouth. That the child's mistake is, that, instead of doing so, he puts the tip of his tongue to the roof of his mouth, which is the way to pronounce *t*. To prove the truth of the rule, you call for a spoon, and, gently holding down the tip of the tongue with the spoon, you tell the child to say cat, and he says it to his own surprise, and the delight of the others who are watching the experiment.

Appendix B.

My Eton experience enables me to give a few useful hints in the matter of writing. To superintend the lower school writing is an occupation in which I take great delight.

A most important element of success in every branch of instruction is this—to make a boy respect what he is doing. No one, in my time, has been a better friend to writing-masters than Lord Palmerston. It may be remembered that some years ago, in the House of Commons, he extolled the old and distinct writing of some eighty years back, in which each letter might be distinguished when deprived of its supporters. The authority and countenance of Lord Palmerston have contributed greatly to our success in teaching writing in the Lower School at Eton. What Lord Palmerston thought important is entitled to respect in the eyes of an Eton Lower School-boy. Many a one has taught himself very good and distinct handwriting in consequence.

I sent one of the Lower School copy-books (that of a little fellow of nine years of age) with his photograph to Lord Palmerston, and received a speedy answer from his Private Secretary, saying that he was desired to say that "Lord Palmerston thought B——'s handwriting remarkably good, and especially on the page which Lord Palmerston had doubled down, the letters being well and distinctly formed, and there being none of those fine strokes which prevent the eye from catching the form of the letter." This book, along with Mr. Evelyn Ashley's letter, itself a model of good writing, is preserved in a glass-case, and is shown to successive generations of Lower school-boys. "This is the writing that Lord Palmerston admired!" "This is the page which Lord Palmerston doubled down!" The book has been a treasure to us.

If the boys are sitting in a good attitude, and pressing equally on both nibs of the pen, (Mr. Harris's rule ensures

this,) a single Master's eye can superintend a large class. I read a story-book out to them while they are writing under the eye of their writing-masters, and make the story do duty in insuring attention by simply leaving off when any one is sitting improperly or looking about. "I leave off because —— is not writing." That is quite enough to brace the whole class up to attention.

In writing, as in all branches of instruction, individualize and classify. We divide the boys periodically into Classes 1, 2, 3. We let Class 1 go when they have had half-an-hour's writing. Class 2 goes at the end of three-quarters of an hour, and Class 3 at the end of the full hour. Any other encouragement that may suit the discipline of the school could be adopted; but inspect periodically, and classify.

I got some useful hints and appliances for teaching writing from the Paris Exhibition. In the Educational Department I saw some curious copy slips of indented metal. I made the acquaintance of the inventor, Mr. Sinet, and got a supply of his indented metal plates. His theory is, that a learner by following the indented letters with his pen is obliged to form them right; a sponge prepares the plate for another writing lesson.

I also got a model hand in the right *pose* for writing, and some inventions of his for keeping the hand in a proper position. They have been of service to some of the younger boys, and are very popular. We call them "Sinet's Yokes."

I called on the old man again last Christmas when in Paris. He was delighted at the popularity of his inventions. When I said to him, "*Voici l'écriture de mon elève avant qu'il ne se soit servi de la machine Sinet, voici son écriture après qu'il en a fait usage,*" it was almost too much for him. I got more "Yokes," and some hints:—

One of these was to practise what he called "*la gymnastique des doigts.*" This consists in doubling up the last two fingers of the hand, and straightening the two writing fingers and the thumb, so as to bring their points together,—

to place their points against the palm of the left hand, and squash them, letting the knuckles give way; this was to be repeated frequently. The wrist is not to be bent in writing, that the muscles of the fingers and thumb may have their full play; to this end the right arm should rest on the table midway between the elbow and the point of the fingers that are supporting the hand on the paper, and the root of the hand should not rest on the table, but be raised just sufficiently "*pour qu'un petit souris blanc puisse passer dessous!*"

Appendix C.

I will add one word to what I have said about arithmetic, in memory of our celebrated visit to Her Majesty's ship "Pembroke." We met an old Naval Instructor on board; he told me he owed all his success as a Teacher to one kind of sum, which he named, from the inventor, "Ranklin." It was to put down a sum of money, £ *s. d.*, and multiply it by the odd figures 3, 5, 7, 9, 11; and then, by the same figures, in an inverse order, 11, 9, 7, 5, 3. If the final results agreed, the sum was right. The odd figures, of course, to preserve the farthings to the end. Examples of weights and measures may be dealt with in the same way.

I am disposed to think, and the St. Mark's Masters agree with me, that this kind of exercise, worked off quickly at odd minutes, has been of use to the School, that it has taught the boys quickness and accuracy.

It has this to recommend it, that it is so easily set; any boy can set himself a "Ranklin," and the consciousness that if there is one error it all goes for nothing, and that he will have to do it all over again, helps, we think, to give that earnest and sustained attention which is requisite for ensuring correctness.

Appendix D.

And here I would put in an admission that, in addition to (not instead of) those mental habits which are formed by the study of language and geometry, the habit of *exact observation*

might be cultivated with great advantage. This, no doubt, is what the advocates of Botany aim at, and I think they are quite right in choosing that particular science. The objects of observation are accessible without expense or difficulty, are infinitely various, beautiful, and interesting; and the observations admit of *perfect precision* with the simplest possible apparatus. Also the pupils incidentally learn something of the principles of classification, besides acquiring information which may turn out to be very useful. In the same way, in suitable localities, I should think Geology might be taught with great advantage. Whereas Chemistry, Electricity, &c., can hardly be taught to boys otherwise than in the way of superficial information.

I think, also, a great deal might be said in favour of elementary Physiology, *even without rats*, for the higher classes of middle schools. Such a book as Huxley's Lessons on Physiology (which is suitable for either boys' or girls' schools), in the hands of an intelligent teacher, might be very useful. And here is a case where a knowledge of facts as such is of real importance; besides, we have got in us the natural faculties of wonder and admiration; and no one who is totally ignorant of the structure of his own bodily organs can have experienced the full exercise of these faculties.

Only let it be always remembered that nothing ought to supersede the solid foundation laid by the old studies, and that in all studies, old or new, it is the training of our faculties which should be the primary object, though, when useful information can be also acquired by the process, so much the better.

Appendix E.

It may not be uninteresting to my readers if I refer to the incidents of this little boy's story; nor is it quite out of place, for it bears on the main subject of my Essay, the value of a Liberal Education to every class. And I am unwilling to lose any opportunity I have of showing how such Education

acts on those whose circumstances and condition would point them out as extreme cases.

This made me, in a former tract, refer to the little Russian boy taken prisoner after the battle of the Alma, and brought to this country by Col. Brownrigg, and put to St. Mark's School. What is he now? An apprentice in the Mercantile Navy, nearly out of his time, who brings home the highest character from his captain and the shipowners for being a smart and active seaman, and "being free from those vices which that class of men are much addicted to." He has every prospect of rising in his calling.

And not only is he an able seaman, who does his duty in a gale of wind, but he can sit beside the bunk of a sick messmate and read a chapter in the Bible to him, and tell or read to him stories of his school-boy days, till the tear gathers in the sick man's eye, and he says, "Oh, that I had been brought up so!"

Whenever his ship comes into port from China, Singapore Calcutta, &c., as soon as he gets leave, down he comes rushing to the old School, to re-visit the old scenes, and renew his acquaintance with his former schoolfellows. Our worthy Russian seems to enjoy nothing much more than to sit beside his old and well-loved Schoolmaster, Mr. Blythe, and listen to him giving a lesson to the new generation of St. Mark's boys.

And now for the story of our little African. He belongs to the Galla tribe, who may be found on the south-west of Abyssinia: they are a very beautiful race, and, in consequence, fetch an immensely high price in the Turkish slave market. The men of the tribe are great warriors, and during his father's absence on some expedition, the Turks kidnapped our little boy, and carried him off to the coast some six or seven hundred miles distant I believe. Here he was shipped for the port of Muscat. Before they landed, by God's good providence, an English cruiser (the "Pantalon") caught sight of the slaver. The Turks (our little fellow tells us) put their money into their turbans and took to their boat; and the slaves,

consisting of women and children, were rescued. Captain W. F. Hastings (then First Lieutenant of the "Pantalon") undertook the whole charge of one of the boys thus saved. He has taken the greatest care of him, and brought him to England, and has put him to St. Mark's School. Here, then, is a new and unexpected case upon which to try the effect of a Liberal Education. Two years ago the boy was an untutored savage in the interior of Africa; he has been about one year under training at St. Mark's, and is now a thorough English boy, and takes rank among his compeers. The school has got hold of his affections, and is moulding his character. He is an intelligent boy, with a sweet disposition and reverent spirit. He is as much interested about getting on in school, doing his evening lessons well, and getting good reports, as any boy in the School. His instincts are gentlemanly; he cannot bear to be taken out from among his companions for any special notice or attention. To be seen to advantage, he should be seen at school, or in the play-ground with his school-fellows. He is a great favourite with them all, and, indeed, with everyone who knows him. His natural disposition is so sweet, that he must have been greatly beloved at home. His own sentiments, and little incidents of his former life which he has told me, prove it. His parents have not the remotest conception where he is. They must have known that he was carried away by the Turks, so that slavery would be the natural consequence; and when I look at him in church, amongst the other boys, with his surplice on—for he is one of our choristers—and observe his reverent demeanour in chanting the Psalms, or following the lessons in his Bible, I cannot but feel an indescribable emotion of gratitude that the dear little fellow is not now in a Turkish seraglio, but that we have him safe in the bosom of St. Mark's School, to bring him up as a Christian boy.

When I saw in the telegram from Abyssinia a few weeks since that the "Gallas" were one of the hostile tribes that were leagued on the south side against the unfortunate and

absurdly incomprehensible Theodore, the idea occurred to me of printing an account of our "Jem," and sending it, with his photograph, to our young St. Mark's serjeants and corporals in the army in Abyssinia; for many of our boys take to the army. I hear of them as young serjeants in a very short time after their enlisting. Their education makes them be picked out; and they all seem very ready to volunteer for foreign or special service.

Now, if in the course of events they should come in contact with the Galla tribe, I know that they would do their utmost by means of the photograph, and of his name Chala, and his father's name Salfey, to bring him, if possible, to the knowledge of some of his kindred; but this may be a wild idea.

Captain Hastings' hope is that the boy may grow up to be a well-educated and good man, and qualified for Holy Orders that so he may be ordained as a Missionary. In which case Captain Hastings hopes to return with him to his own country, and go with him into the interior of Africa to search for his tribe and parents; that our boy may, according to his own great wish, hope, and prayer, "tell his father and mother about Jesus Christ."

Morally and intellectually, I see no reason to doubt about the fulfilment of the desire of both; nor do I at all see why we should not hope to rear our Jemmy to man's estate. He has passed through two English winters, and is in excellent health. God grant this blessed conclusion to the dear boy's romantic history, and may St. Mark's do its part towards bringing about the fulfilment of the pious hope of his protector and friend.

Appendix F.

Nor, indeed, has this intercourse ceased. The cahiers given to me by the Sallenches' school-boys have been handed round St. Mark's School, and are greatly admired. Their neatness I hope will be imitated.

I have before me at this moment letters which "*Le petit*

nègre," and one of his school-fellows, have written to Henri Révenaz, to accompany their photograph which they have had taken for him. These I am to translate, (for our African has not, of course, begun French, nor has the other, though learning it, yet attempted a French letter,) and under the two figures in the photograph I am to write in French, "White," "Black," so says our little negro.

It enters very largely into my idea of a Liberal Education to draw the boys out of themselves, and to give them external sympathies and wide-spread interests. With this view I have encouraged intercourse and correspondence between them and Bishop Patteson's Melanesian boys. Our boys know his by name, have sent photographs and presents to them, and have received letters from them.

And now, while on this subject, I may add, that not only do our boys know about and correspond with lads living in the mountains of Savoy, but I hope, before two years are over, that the acquaintance will be a personal one, and that the Savoyards of the Pensionnât of Sallenches will accompany the St. Mark's boys in their mountain excursions.

Poor untravelled English boys living in a flat country, who have seen but flat maps with a little shade for mountains, what can they know of Physical Geography except in words? But when I have taken them up the enchanting valley of Montjoye, and have led them up its wilder and wilder fastnesses till they have stood on the rugged "neck of the Bonhomme," henceforth, indeed, the chain of the Pennine Alps will have a different meaning for them than it has hitherto had.

This most pleasant prospect we have, for the offer of the free use of three large "Granges" for the St. Mark's boys has been made me in three choice localities in Swizerland, St. Gervais, Chamonix, and Comballaz, by *propriétaires* who wish to send their sons to St. Mark's.

Indeed, I may here say what I think will interest many an English family, that the motherless grandchildren of one

who is known to many as a much esteemed guide, "Michel Alphonse Couttet," are coming to St. Mark's as soon as they are old enough. I am told that the thought of this was the comfort of their poor mother on her death-bed.

I need hardly apologize for wandering into these details. I am giving the account of an attempt to give a Liberal Education to boys of the working class, and these summer excursions are, as my friends know, a very prominent feature of my system. I have only to tell those friends who have read with kindness the visits of St. Mark's to the "Pembroke," &c., that, if this excursion takes place, they may count upon having a new St. Mark's Story,—"St. Mark's in Switzerland."

Appendix G.

The idea of the various classes of the Nation being drawn into one great English brotherhood is one that has been long uppermost in the writer's mind. This will be seen in the following Address, which he circulated in the year 1859, along with copies of the account of St. Mark's School, among the Parochial Schoolmasters of England, through the hands of their Clergymen. It is reprinted here in the hope that it may do good:—

An Address to Parochial Schoolmasters, circulated in 1859.—This paper will probably be put into your hands with a pamphlet, called "An Account of St. Mark's School, Windsor." I hope that you will not think I am taking a liberty if I ask you to peruse the tract; and, in connection with it, point out to you, that it is in your power to help forward a great social movement—full of hope for the future—which may be called the distinctive feature of our day. I mean the increasing community of feeling and interest

amongst the different classes of society, which is gradually drawing them together, and is giving to England more and more the character of one large family.

About the fact, thank God, there can be no doubt. And of the causes which conspire to bring about this result, none certainly is more influential than the personal character of the Queen of England, considered both as a Sovereign and a Mother.

There are Physical causes, no doubt, which it is impossible to overlook. The great moral engine, however, is doubtless the thought and care which very many of those who occupy a position in the country, corresponding to that of parent in the family, bestow in furthering the well-being of their dependents. The great Landed Proprietors of the country, beginning with the Highest Personages in the realm, give constant proofs of this feeling. So also do the great Manufacturers and Tradesmen of the country: the provision which many amongst them have made for the social improvement of their dependents is proverbial. A similar kindly and parental feeling is also widely extending itself between Merchants and Professional men and their Clerks; and instances have come within the writer's knowledge of its exercise in public offices, between the heads of departments and their subordinates in the office.

The friendly relation which has long existed between the Clergy of the country and their people is too obvious to allude to. But I may mention another phase of English life which has been revolutionized by the action of friendly sympathy between classes—I mean the English Army. Thirty years ago, a regiment was little more than a great machine organized to produce a certain result: from a great machine it is now transformed into a large family. The officers know their men individually. Their moral and religious well-being, —their health—their social recreations—their manly sports —their families—all occupy much considerate thought on their part. The men can see this, and meet it with a feeling

of loyal attachment to their officers. The existence of this friendly relation between officers and men is well known to those who have the opportunity of observing the inner life of a regiment ; and its effect was abundantly evidenced in the endurance, gallantry, and devotion exhibited in the last two wars in which this country has been engaged.

In the Navy, with the rough materials of which a man-of-war's crew is made up, it might be supposed that this kindly regard and fellow-feeling must give way to a sterner rule ; but the contrary is the fact. The martinet-rule is fast dying out, or has died out, of the service ; and those vessels will be found in the highest state of discipline where the friendliest feelings exist between the officers and men.

You will see this statement exemplified in a little pamphlet (which will possibly be put into your hands along with the account of the School), giving the history of a week which some of the boys of St. Mark's School were privileged to spend on board a man-of-war. The story has not only been read with pleasure in this country, as an illustration of the foregoing statement, but has excited a lively interest wherever it has been read on the Continent—as giving an agreeable peep into an English man-of-war, and as detailing occurrences which (it has been frankly observed) could not have happened on board a ship of war belonging to any nation in the world but England.

This testimony is important as showing that the bond of family feeling, which rendered the occurrences of the narrative possible, is thoroughly English.

It will be seen from these various instances that there is hardly a ramification of English life into which the working of this principle has not in some measure penetrated. It is the bond which keeps the whole machinery of English society together and in good working order. If there is any part that does not work well, if any hitch occurs that throws any part of the machine out of gear, or brings it to a standstill, it is because this bond is displaced, or wants tightening.

My object, however, in addressing you is mainly to trace the working of this principle in the economy of schools.

There has been for several years, in the great schools of the country, and those private schools which have the largest share of the confidence of parents, an increasing cordiality of feeling, and friendliness of intercourse, between tutor and pupil, which has been followed with the happiest effects.

The very great confidence which the public schools of England enjoy at the present time, and the high esteem in which they are held on the Continent, arises mainly from the influence on the formation of character of this mutual good understanding, confidence, and sympathy existing between the tutor and the pupil.

It is evident that not only is the freedom of mind and happiness of the boy at school justly attributable to a good understanding with his tutor; this must also be the mainspring of the happiness and comfort which the tutor himself has in his work. Certain I am, that this friendliness of feeling between tutor and pupil is what parents most desire; and those tutors are the most valued in our public schools and elsewhere who sympathize most heartly with their pupils.

Will it be said that this kind of parental relation between tutor and pupil is very possible with those who have been well brought up at home, who are well toned, and responsive; but that such a relation could not exist between the Master of a National School and the kind of children which he has to educate?

Let me say in reply, that it is now about eighteen years since, observing the happiness and unaffected manliness of boys brought up under the culture I describe, I first asked myself, Must this be confined to the rich? What would be the effect if a similar relation were established between the teacher and the taught, at schools for the children of the poor? What if *their* boyhood were also made a joyous one, by kind usage and friendly confidence on the part of the Master? Would it unfit them for the life of toil in prospect for them?

I resolved to try the experiment. The history of St. Mark's School is the history of that experiment; and an experience of above thirteen years warrants me, I think, in saying, that the same principles of treatment which are pursued at the great schools of the country, with the sons of the gentry of the land, (viz., vigorous mental cultivation, joined with trustfulness and cordiality in intercourse with them,) may be safely pursued with the children of the poor; and that, far from unfitting them for their position in life, such training will, under the Divine blessing, make them useful, simple-minded, well-conditioned, and pleasant to deal with; in a word, valuable men in all the relations of life.

It is a strong confidence in the truth of the above, which leads me to invite you to read the tract on St. Mark's School. If you have established such a relation with your scholars as is there described, you will learn with satisfaction that others are pursuing the same plan, with comfort to themselves. If you have not hitherto contemplated the possibility of being on such terms with your boys, I trust you will be encouraged to try this method of dealing with them; and be assured, that it will prove not less full of happiness to yourself than of benefit to your scholars.

S. HAWTREY.

Mary S. Rickerby, Printer, 4a, Walbrook, Mansion House. E.C.

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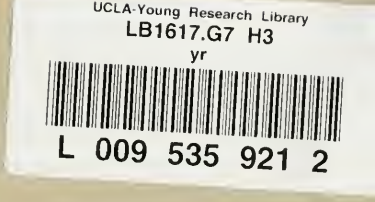

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